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THE
ENTOMOLOGIST'S
MONTHLY MAGAZINE:


CONDUCTED BY

C. G. BARRETT.	E. C. RYE, F.Z.S.
J. W. DOUGLAS.	E. SAUNDERS, F.L.S.
R. McLACHLAN, F.R.S.	H. T. STAINTON, F.R.S.

VOL. XVII.

"In relation to the human mind Nature is boundless; and though nowhere inaccessible, she is everywhere unfathomable."

HUXLEY.



LONDON:
JOHN VAN VOORST, 1, PATERNOSTER ROW.

1880-81.



HB443

LONDON :

NAPIER, PRINTER, SEYMOUR STREET, EUSTON SQUARE.

MDCCCLXXXI.

THE

Entomologist's Monthly Magazine

VOLUME XVII.

We have much pleasure in announcing that with the commencement of Vol. XVII of this Magazine, the Editorial staff will be increased and strengthened by the addition to it of Mr. CHARLES G. BARRETT, who has, from the first, so greatly assisted us, and whose labours in investigating the British Lepidopterous Fauna are so well and favourably known; and of Mr. EDWARD SAUNDERS, who, for many years, has turned his attention to other Orders of British Insects with equally beneficial results.

EDITORS.

1, Paternoster Row, London, E.C. :

15th May, 1880.

A NEW SPECIES OF *LIPURA*.

BY HENRY N. RIDLEY.

This insect I found in April, in the same locality as that of *Machilis brevicornis*, namely, at Water-break-its-neck fall, near New Radnor.

The head is ovate, the antennæ four-jointed, the last joint the largest, and oval in shape. The second segment of the body, i.e., the prothorax, is narrow, the third and the fourth are the broadest, the terminal segment is the smallest. I can perceive no trace of eyes. The last segment bears two short up-curved processes, and the whole body is covered with scattered hairs. The colour of the body is orange, the head and the last segment lighter yellow, the under-side is also lighter in colour, and the alimentary canal seen through the translucent skin causes the middle line of the back to appear darker. The feet and antennæ are snow-white.

Length, $2\frac{1}{2}$ mm.

This little animal differs chiefly from *L. ambulans* (L.) in colour, and also in facies, being broader in proportion to its length, and having the joints of the antennæ more distinctly separate. It lives under stones, moving about very briskly, in spite of its blindness, and the contrast between the orange body and white antennæ and feet makes it an extremely beautiful little insect. All its colour disappears in spirits and it becomes quite white.

I propose for it the name *Lipura aurantiaca*.

20, Portsea Place, Connaught Square :

May, 1880.

A NEW SPECIES OF *MACHILIS*.

BY HENRY N. RIDLEY.

On May 1st, 1879, in an expedition made with the Woolhope Society's Field Club to the waterfall known as Water-break-its-neck, in the Radnor Forest, I captured three specimens of a *Machilis* unknown to me; at that time I had not carefully studied the genus, and so referred them to the species *polypoda* (Linn.), but on further examination I was convinced that the species was new; and having this year succeeded in procuring additional specimens, am enabled to describe it.

The length of the body is 9 mm., and that of the antennæ 4 mm.; the central caudal seta is 8 mm. long. The colour varies somewhat according to age, the adults are brown and metallic, with a thin darker central line on the back, and three irregular dark brown patches on each side. The legs, antennæ, and caudal seta are brown, the latter ringed with paler colour. The younger forms are grey, and more irregularly mottled. None that I have seen are as dark as *M. polypoda*, and most are much lighter. The head is small, the eyes black, and almost touched by the front edge of the prothorax, they meet in the middle line. The prothorax is narrow and cylindrical, the meso-thorax broad and elevated, the meta-thorax narrow, and partially overlapped by the meso-thorax. The segments of the abdomen are nearly equal, and taper gradually towards the tail. The antennæ have a thick basal joint, which is followed by a whip-like portion, composed of numerous small segments, and these, at the extremity, are marked off into three secondary segments, each consisting of five of the smaller segments. The whole is thicker than the antenna of *M. polypoda*, and much shorter, since, in the usual position of rest, when the antennæ are laid back along the sides, they hardly extend to the end of the meta-thorax. The large palpi are composed of six joints, very little (less than 1 mm.) shorter than the antennæ. The second pair of palpi are short and 3-jointed, the last joint being ovate.

The legs are biunguiculate, and the last two pairs bear papilliform processes on the basal joint, corresponding to those described by Sir John Lubbock in *M. polypoda*, and which he supposes to be homologous with the abdominal appendages. The central caudal seta is nearly as long as the body, being 8 mm. in length.

The scales, which I have been able to compare with those of *M. maritima* only, differ from them in their smaller size, and in the greater number of ridges, which vary from fourteen to sixteen in this species, whereas in *maritima* they are generally not more than twelve in number; in *M. polypoda* (Beck, in Lubbock's *Thysanura* and *Collembola*, Ray Society publication) the ridges vary from eighteen to twenty-four. Another distinction may be noticed in the pedicel, which, in this species and *M. polypoda*, projects beyond the base of the scale, but does not do so in *maritima*. The general arrangement of the ribs and cross-bars is the same in all; but I observe in the species now under consideration that in the rounded or ovate scales, which I conclude are the younger forms, the ribs converge to the centre from both sides, so as to form a succession of Vs, with the apex pointing away from the pedicel: this I can find no trace of in the scales of *M. maritima*.

The insect lives under stones in dry places, and always appears rather sluggish, indeed, when the sun was not shining, it did not leap at all, but slowly crept away when disturbed. It appears to be very local, as I only found it in a very circumscribed area, although there were many likely places for it close by. It is by no means easy to find, owing to its colour, and the way it adheres closely to the stone when it is lifted.

I propose for this species the name of *Machilis brevicornis*, in allusion to the shortness of its antennæ, which are shorter than those of any *Machilis* with which I am acquainted, except *M. crassicornis* (Lucas), which occurs in Algeria.

I ought to call attention to the fact that in some features Templeton's figure of *M. polypoda* (Trans. Ent. Soc., vol. i, plate xi) bears a considerable resemblance to this species, but as his figure is so roughly drawn, and as he gives no details nor colour with it, it is impossible to say whether or not he had this species before him.

I should also have mentioned that the insect became of a yellowish-white colour in spirits.

20, Portsea Place, Connaught Square:
May, 1880.

NOTES ON *CRABRO ELONGATULUS*, V. DER LIND., AND THE OTHER
BRITISH SPECIES OF *CRABRO* WITH BLACK BODIES.

BY EDWARD SAUNDERS, F.L.S.

Of all our British species of *Crabro*, *elongatulus* seems to have been the cause of the greatest confusion; Shuckard* describes it under seven different names, F. Smith under five. On the continent

* Essay on the Indigenous Fossorial Hymenoptera, 1827.

it seems to have fared better, as Dahlbom,* although he mentions four of Shuckard's species, yet only describes one (*elongatulus*) in full, giving very short diagnoses of the others, two of which he says he has never seen; Wesmaelt† only describes *elongatulus*, and says that he is disposed to consider all Shuckard's seven species as varieties of it. Thomson‡ also only describes *elongatulus*, but says nothing whatever about its synonymy. Morawitz§ gives *elongatulus* with full synonymy, including all Shuckard's seven species.

There is, I think, little doubt that the view held by the continental authors is correct. I have the good fortune to possess Shuckard's collection of this group, and an examination of it quite bears out their opinion. He only knew the ♂ of *elongatulus*, *luteipalpis*, *proximus*, and *transversalis*, and only the ♀ of *hyalinus* and *obliquus*; of *propinquus* he appears to have known both sexes, but the ♀ only remains in his collection. I have carefully examined all his specimens (*transversalis* he did not possess), and can find no specific difference between the three ♂ or the three ♀; he himself suggests that *luteipalpis* may be a var. of *elongatulus*, and that *proximus* differs from it only in colour, and he also states that he has taken *obliquus* in company with *elongatulus*, and yet it never seems to have occurred to him that they could be ♂ and ♀ of the same species; his primary division of the black species is between those with the "base of the metathorax smooth and shining," and those with the "base of the metathorax striated," and it is this division which has led to all the confusion, as it throws the ♂ into one section and the ♀ into the other. That these ♂ and ♀ belong to each other I think there can be little or no doubt, as they occur together in the same localities, and agree in coloration, punctuation of the thorax, &c., and have been considered as sexes of one species by all the continental authors. Smith has adopted Shuckard's divisions, and therefore comes to similar conclusions as to the sexes, but he gives a ♂ to *pallidipalpis* and to *obliquus*, what these are, his descriptions do not show, as he only gives a few words to each; but, taking everything into consideration, I think that we may with safety agree with the continental authors, and refer all our seven so-called species to one. The following table of our black-bodied species may be useful to some of your readers:

- (4) 1. Body petiolated, 1st segment terminating in a node.
 (3) 2. Face with a blunt spine between the antennæ, apex of the tibiae red...
tibialis.

* Hymenoptera Europæa, vol. i, 1845.

† Revue Critique des Hyménoptères fourisseurs, Acad. Royale de Belgique, t. xviii.

‡ Hymenoptera Scandinaviae, vol. iii.

§ Crabronides de St. Petersburg, Bull. Acad. Imp. Sciences Pétersb., vol. vii.

- (2) 3. Face without a spine, apex of tibiae black *clavipes*.
- (1) 4. Body not petiolated, 1st segment not terminating in a node.
- (30) 5. Cheeks beneath without a strong spine.
- (19) 6. Last segment of abdomen in ♂ not more strongly punctured than the preceding, excavated in the ♀.
- (14) 7. Basal area of metathorax not clearly defined.
- (9) 8. Posterior tibiae very clavate and rounded, without spines or teeth along its outer margin *capitosus*.
- (8) 9. Posterior tibiae more or less dentate or spinose.
- (13) 10. Metathorax with a wide central channel, which is distinctly margined, front legs of ♂ simple.
- (12) 11. Legs entirely black *leucostoma*.
- (11) 12. Front legs testaceous-brown *pubescens*.
- (10) 13. Metathorax with a simple, narrow, central, impressed line, front legs of the ♂ scutate *cestratus*.
- (7) 14. Basal area of metathorax clearly defined.
- (16) 15. Punctuation of thorax so fine and indistinct as to be scarcely visible, except under a strong power *podagricus*.
- (15) 16. Punctuation of thorax distinct.
- (18) 17. Clypeus black, front legs of ♂ scutate *ambiguus*.
- (17) 18. Clypeus flavous, front legs of ♂ simple *aphidum* = *Walkeri*.
- (6) 19. Last segment of body in the ♂ more strongly punctured than the preceding, not excavated in the ♀.
- (23) 20. Front legs of ♂ scutate, both sexes with the calcaria of the front legs black, or with the clypeus and mandibles yellow.
- (22) 21. Larger, basal area of metathorax large, shining, finely strigose, ♂ tibiae scutate, clypeus and mandibles yellow *palmarius* = *scutatus*.
- (21) 22. Smaller, basal area of metathorax small, dull, and very coarsely strigose, ♂ tibiae simple, 1st joint of tarsi scutate, calcaria in both sexes black... *palmipes*.
- (20) 23. Calcaria of front legs pale, clypeus not yellow.
- (27) 24. Mesopleuræ spinose.
- (26) 25. Metathoracic area striated *varius*.
- (25) 26. Metathoracic area smooth and shining *exiguus*.
- (24) 27. Mesopleuræ not spinose.
- (29) 28. Thorax more or less shining, punctuation fine but not so very close, tibiae widely pale at the base, metathoracic area polished and shining in both sexes, rarely finely striate in the ♂ *Wesmaeli*.
- (28) 29. Thorax dull, punctuation very close, tibiae very narrowly pale at the base, metathoracic area deeply striate in the ♂, striate at the sides only in the ♀ *elongatulus*.
- (5) 30. Cheeks with a strong spine *4-maculatus* (black var.).

I have not included here *Crabro albilabris*, *Panzeri*, or *brevis*, of Shuckard and Smith, as the two former belong to the genus *Lindenius*, and the last to *Entomognathus*; they may all be known from the other black-bodied species by having their ocelli arranged in an isosceles triangle, much widest at the base.

Holmesdale, Upper Tooting :

May, 1880.

ON TWO SMALL CONSIGNMENTS OF *LEPIDOPTERA* FROM THE
HAWAIIAN ISLANDS.

BY ARTHUR G. BUTLER, F.L.S.

The following species were received some time since from the Rev. T. Blackburn, but press of work has hitherto prevented me from working them out.

1. *DANAIS ARCHIPPUS*, *Fabr.* (No. 1.)

This specimen somewhat resembles the southern American type in coloration. According to Messrs. Salvin, Godman, and others, it would appear that this is the species intended by Linnæus in his original description of *Papilio Plexippus*, but as he gives China as one of his localities, it seems better to retain a name respecting which there can be no doubt.

2. *PROTOPARCE BLACKBURNI*, *sp. n.* (No. 30).

P. quinquemaculato simillima; major, alis latioribus, magis grisescentibus; signis alarum anticarum subcostalibus albescentibus; serie macularum albarum antice confluentium arcuata discali, cum fascia ordinaria nigrocineta cohærente; fasciola posticarum prima obsoleta; fascia sub-marginali nigra apud apicem multo latiore: alar. exp. unc. 5.

"Occurs rarely near Honolulu."—T. B.

This handsome species, although nearly allied to the North American insect, is evidently quite distinct; the wings are decidedly broader, the inner margin of the primaries longer and more curved, and the outer margin consequently less oblique; in colour it is greyer, and the light markings are more or less white; the arched double discal belt is represented by two coherent bands, the inner one consisting of confluent, black-edged, lunated, white spots; the white spotting of the fringe is purer, and, consequently, more evident; the sub-basal diffused black band of the secondaries is absent, and the sub-marginal band is broader, being of twice the width at costal margin;

the orange spots on the body decrease more suddenly in size towards the anal extremity, the last spot of the series being of about one-fourth the size of that in *P. quinquemaculata*.

3. *DEILEPHILA LIVORNICA*, *Esper* (No. 2).

Oahu.

This insect came, with some of the succeeding species, all in a more or less broken condition, through Mr. J. B. Blackburn: I have thought it best to include them with the last consignment, as some of them have not been sent home in other collections made by our generous correspondent.

4. *LEUCANIA DISLOCATA*, *Walk.* (No. 6).

Not marked with the exact habitat.

5. *LEUCANIA EXTRANEA*, *Guenée* (No. 63).

"Taken at light. Widely distributed, but rare."—T. B.

6. *PRODENIA INGLORIA*, *Walk.* (No. 9).

Oahu.

7. *CARADRINA VENOSA*, *sp. n.* (No. 8).

C. cubiculari affinis; alis angustioribus, anticis supra pallide fuscis macula orbiculari indistincta, testacea nigro partim cincta; macula reniformi argillacea lineam angulatam albam includente, marginibus nigro punctatis; lineis ordinariis indistinctis, duplicibus, albido impletis, nigris; area externo albo sparsa; signis minutis angulatis submarginalibus nigris; margine externo albido, linea marginali tenui fusca; ciliis albidis fusco intersectis marginatisque; alis posticis margaritaceis hyalinis, venis fuscis; marginibus costali et externo fuscescentibus nitidis; ciliis argenteo albis, linea media indistincta cinerea; thorace fusco, abdomine albido-fusco. Subtus alba, alis nitidis, costis colore arenoso tincta; corpore sordide albo: alar. exp. unc. 1, lin. 1.

"Near Honolulu. Rare."—T. B.

8. *AGROTIS SUFFUSA*, *Gmelin* (No. 55).

Honolulu.

This is quite distinct from the unnamed *Agrotis* previously sent by Mr. Blackburn.

9. *SPÆLOTIS LUCICOLENS*, *sp. n.* (No. 12).

S. pyrophila affinis; alis anticis supra pallide arenaceo-fusca; maculis discoidalibus obsoletis; lineis duabus ordinariis tenuibus nigris, inferiore transversa irregulari, exteriori arcuata dentata discali; limbo externo paululum pallidioris introrsum undulato; serie punctorum nigrorum marginali; punctis tribus costalibus nigris; ciliis introrsum testaceis fascia media et linea marginali cinereis; alis posticis pallide cinereo-fuscis area abdominali ciliisque albidis: thorax pallide

fuscus; abdomen arenoso flavidum. Subtus sordide alba; alis nitentibus, punctis marginalibus nigris; anticis nebula discali cinerea; posticis strigula discali ad costam solum distincta cinerea: alar. exp. unc. 1, lin. 9.

Honolulu. "Very rarely, at light."—T. B.

10. *SPELOTIS CREMATA*, *sp. n.* (No. 10).

*Affinis S. fugaci, alis anticis cinereis testaceo nebulosis; linea dentato-sinuata duplici nigra albido impleta, aream basalem limitante et furcam sub-basalem introrsum ad costam mittens; costa nigro alboque punctata; macula reniformi maris testacea angulata nigro-cincta testaceo circumcincta, feminae albida testaceo persecta, inconspicua; linea duplici discali nigra, albido impleta, dentato-sinuata; serie macularum albarum nigro introrsum marginatarum submarginali, apud costam angulata; serie punctorum nigrorum marginali; ciliis linea basali testacea; alis posticis fuliginoso-fuscis sericeis, ciliis albis; thorax cinereus rufo strigosus; abdomen fuscum: alis subtus fere velut in *S. fugace*, anticis autem cinereis strigis duabus discalibus maculaque ordinaria cinereis indistinctis: corpus subtus cinereum, pectore albido-crinito: alar. exp. unc. 1, lin. 9.*

♀. *Paulo major, lineis multo pallidioribus rufescentibus: alar. exp. unc. 1, lin. 10.*

♂. "Bred from a pupa found in a sandhill on Maui."—T. B.

♀. Oahu.

11. *HELIOTHIS CONFERTA*, *Walker* (No. 4).

"Bred from larvæ found very rarely in company with that of *Vanessa Huntera*, on flowers of a species of 'everlasting,' on Maui."—T. B.

12. *PLUSIA VERTICILLATA*, *Guenée* (3).

Oahu.

13. *TOXOCAMPA NOCTIVOLANS*, *sp. n.* (No. 64).

Ala antica supra olivaceo-fusca, cinereo reticulata; macula sub-basali triangulari nigra; lineis ordinariis aream mediam leviter obscuram limitantibus tenuissimis albidis nigro-maculatis; linea interiore obliqua, linea autem discali transversa, angulis tortuosis sinuatis; costa nigro-punctata; margine externo apud apicem sinuoso; postica cinereo-fusca, ciliis albis; margine externo sinuoso: corpus olivaceo-fuscum; ala antica subtus cinerea, linea discali partim distincta; area externa pallidiore extrorsum argillaceo tincta fusco reticulata; margine costali nigro alboque punctata; postica albido-fusca fusco cinereoque reticulata; lineis duabus dentato-sinuatis costalibus ferrugineis; area apicali late testacea: corpus subtus roseo-fuscum ventris segmentis cinereo marginatis: alar. exp. unc. 1, lin. 4.

"Flying at dusk, 4000 feet up Haleakala, Maui, two specimens taken."—T. B.

14. *SCOTOSIA RARA*, *Butler* (No. 90).

♂ ♀. "On trunks of trees, Mauna Loa, Hawaii. 4000 feet above sea."—T. B.

The female is darker than the male, but does not otherwise differ in coloration; the antennæ are, of course, simple in this sex.

15. *HYPENA OBSOLETA*, *Butler* (No. 14).

Oahu.

16. *HYPENA INSIGNIS*, *Butler* (No. 14).

Oahu.

These two species (for such I still believe them to be) came in the small series forwarded through Mr. J. B. Blackburn, and previously referred to; unfortunately, they have lost their abdomina.

17. *HYMENIA FASCIALIS*, *Cramer* (No. 25).

Oahu.

18. *SCOPULA EXIGUA*, *sp. n.* (No. 27).

Ala antica supra argillaceo-fulva, roseo tincta; maculis discoidalibus et linea discali falciformi cinereis; ciliis fuscescentibus; ala postica fusca aureo paululum nitentes, limbo costali albo; ciliis albo acuminatis, linea cinerea persectis: corpus supra argillaceo-fulvum, roseo tinctum; ano albido: ala subtus pallide testacea, punctis marginalibus nigris; areis internis ciliisque albis; antica linea discali punctisque discoidalibus indistinctis cinereis; punctis duobus tribusve costalibus nigris: corpus subtus album sericeum: alar. exp. lin. 7.

Maui.

Nearer to *S. flavidalis*, of New Zealand, than to any other described species.

19. *SCOPARIA ALTIVOLANS*, *sp. n.* (No. 97).

Ala antica supra fusca, paululum sericea et aureo tincta; macula ad costam basin obscura, nigro marginata; fascia obliqua pone medium obscure fusca, lineis nigris albo-marginatis limbata, linea interiore angulis alternis irregulari; linea externa angulata; litura discocellulari extrorsum albo marginata introrsum plus minusve diffusa; virgula simili costali; linea discali angulata albida aream externam limitante; costa pone medium albido punctata; serie punctorum nigrorum marginali; postica pallide cinerea; thorax supra fuscus, abdomen cinereum: ala subtus cinereo albida punctis marginalibus nigris, ciliis ad basin ochreis; antica costa pone medium albo punctato; area discoidali obscura; postica puncto discocellulari et linea discali cinerea: corpus subtus albido fuscum: alar. exp., ♂, lin. 8; ♀, lin. 9.

"Mauna Loa, Hawaii; 4000 feet above sea."—T. B.

The male is less strongly marked than the female, but this may be an individual variation, or even the result of abrasion.

Perhaps this species is nearer to *S. sudeticalis* than to any other known species, but it is very different.

REMARKS ON SOME BRITISH HEMIPTERA-HETEROPTERA.

BY DR. O. M. REUTER.

(Concluded from vol. xvi, page 175).

In No. 157 (vol. xiv, p. 11) of this magazine, I began some remarks on British *Hemiptera-Heteroptera*, which I will now finish. I have only to make some corrections of my previous remarks, and to reply to several objections made by Mr. Douglas to different points of my observations.

PENTATOMA BACCARUM, E. M. M., xiv, p. 11. Mr. Douglas's remarks concerning the nomenclature of this species are quite correct, and I am obliged for the elucidation he has given. However, I still think *P. fuscispina*, Boh., is a good species, and different from *nigricornis*, Fabr.

NEIDES PARALLELUS, l. c., p. 12. Mr. Douglas admits this species to be only an imperfectly developed form of *N. tipularius*, Linn.; but he says that it can hardly be termed brachypterous, "for it has fully developed elytra, the wings only being short:" still, I think that the term "brachypterous" may be employed in this case. The dimorphism is here of the same kind that Dr. Sahlberg has named "cryptodimorphism" (Reut., Ann. Soc. ent. de Fr., sér. v, t. 5, p. 233), the brachypterous form having the elytra only a little shorter, or, at least, with narrower membrane, than the macropterous, but the wings always much shorter, and the pronotum posteriorly narrower and less convex. The membrane in *N. parallelus* is not "fully developed," being much narrower than in *N. tipularius*.

SCOLOPOSTETHUS ERICETORUM, l. c., p. 13. Mr. Douglas thinks this species is not *decoratus*, Hahn. This opinion has, however, not been approved either by Dr. Puton or by Dr. Horváth; and I also must continue to hold my concurrent opinion. The figure 71 of Hahn (Wanz. Ins., i, p. 139), can never be regarded as representing any other species than *ericetorum*. All the legs are black, the antennæ black, with the exception only of the extreme base of the second, and the extreme apex of the first joint. These are just the characters of *ericetorum*, which also often has the first joint of the antennæ quite black. The figure given by Hahn can nowise represent *affinis*, which has the first joint of the antennæ quite red, or only toward the base black, and the second joint only in its apical half black, and the rest red, or sometimes almost entirely red. In *affinis* only the anterior legs

are black, the intermediate ones being red, and the hind legs also red, or with a black ring before the middle. This is Hahn's "Abänderung c," under which the description of Schilling is cited verbatim: "*antennis basi rufis, pedibus pallidis, femoribus anticis nigris.*" On the contrary, the description of the type of Hahn gives the following characters: "Fühler schwarzbraun, das erste Glied derselben am Ende und das zweite am Grunde röthlichgelb: die Füße röthlichgelb, *alle Schenkel*, mit Ausnahme der Spitze derselben, *schwarz.*"*

ORTHOTYLI, with green cell-nerve and somewhat diaphanous shining elytra. In my remarks on these species (No. 159; vol. xiv, p. 60), some typographical errors are to be corrected. Line 17, from below, p. 60, for "the first joint," read "the third joint;" p. 61, line 7, from above, for "somewhat sharply," read "not;" and, the same page, line 19, for "head," read "third."

By examining a greater quantity of material, I have reduced the British species to the following:—

- 1 (2.). First joint of antennæ, beneath, with a black streak.

O. stricornis, Kirschb.

- 2 (1.). First joint of antennæ unicolorous.

3 (4.). First joint of antennæ as long as the head; second joint with some longer exerted very fine hairs, the last two joints together shorter than the second; third joint a little less (♂) or a little more (♀) than twice shorter than the second; fourth joint as long as the first, and less than twice shorter than the third. Vertex distinctly carinate. The genital segment of the ♂ scarcely broader than the other, and as long as the five preceding segments together. $5\frac{1}{2}$ — $5\frac{1}{4}$ mm.

O. viridinervis, Kirschb.

- 4 (3.). First joint of antennæ shorter than the head, second joint without exerted longer hairs.

* According to this discrimination, the synonymy will be:—

DEODRATUS, Hahn.
ericetorum, Leth.

AFFINIS, Schill.
decoratus, Abänd. b and c, Hahn.

I had, however, cited (Brit. Hem., p. 183; the Abänd. b and c as = *adjunctus*, D. and S., and I still think so, at any rate, with respect to the former. The Abänd. b is described: "Das erste und zweite Fühlerglied ganz und das dritte zur Hälfte, nebst den Schenkeln des zweiten und dritten Fussespaars, röthlichgelb," exactly agreeing with *adjunctus*: the Abänd. c seems to be merely the brachypterous form of b, but in view of the appended verbatim description of *affinis*, that species may be indicated. In any case it is agreed that *adjunctus*, D. and S., and *affinis*, Schill., are good distinct species—as species are now reckoned.

If, as Dr. Reuter says, Hahn's figure 71 cannot be regarded as representing any other species than *ericetorum*, yet it will have to be admitted that for this both the figure and description are in some points unsatisfactory. Thus, Hahn says that the antennæ are stronger than in *S. pictus*, and they are so represented; that the first joint at the end and the second at the base are reddish-yellow, and the figure shows them largely so; but in *ericetorum* the antennæ are not stouter than in *pictus*, and the light colouring of the first and second joints is pale yellowish (not reddish-yellow), and of very slight extent on either, and, as Dr. Reuter says, the first joint is sometimes wholly black. All the thighs are said to be black, except at the apex (the figure does not show the base), but in *ericetorum* the second and third pairs are longly reddish-yellow at the base, in all the British and foreign examples I have seen. Lastly, Hahn says his *decoratus* is found under moss at the foot and on the roots of "Fichten und Föhren," which stand at the sides of woods; whereas, with us, *ericetorum* is found exclusively among heather (*Calluna*), and mostly where no fir-trees grow.—J. W. D.

5 (8.). Anterior legs, beneath, without long bristly hairs. The elytra without intermixed fuscous hairs. The eyes of ♂ not very large and convex. Vertex not, or very indistinctly, carinate.

6 (7.). Fourth joint of antennæ scarcely twice, or a little less than twice, shorter than the third, and distinctly longer than the first. The genital segment of ♂ broader than the preceding ones; the forceps very large, the right lobe bidentate, on the left lobe the teeth very long-produced *O. prasinus*, Fall.

7 (6.). Fourth joint of antennæ twice (♂), or more than twice (♀), shorter than the third, and scarcely (♀), or very little, longer (♂) than the first. The genital segment of ♂ scarcely broader than the others; the forceps moderate, the right lobe bidentate, with the teeth short, almost equal *O. Scotti*, Reut.

8 (5.). Anterior legs, beneath, with a series of long, pale, bristly hairs. Hemelytra often (especially in the ♂) with rather numerous intermixed fuscous hairs. Vertex carinate, in the ♂ almost narrower than the very convex, prominent and large eye. Eyes, in ♂, above, approaching each other. Antennæ (especially in ♂) rather robust, very densely and finely fuscous-pubescent; third joint only one-seventh or one-eighth (♂), or one-fifth to one-fourth (♀) shorter than the second, and two and one-third—almost three times—longer than the fourth; fourth joint as long as, or scarcely longer, than the first. Genital segment of ♂ small.

O. diaphanus, Kirschb.

GLOBALICEPS FULVIPES, *l. c.*, No. 171. In vol. xv, p. 66, I have given the differential characters of *fulvipes*, Reut., and *flavomaculatus*, Fabr., Reut., but now, in reading the descriptions of the British authors, I find that *fulvipes*, Saund. (= *flavomaculatus*, Dougl. and Scott) cannot be referred to *fulvipes*, Reut. Messrs. Douglas and Scott say (Brit. Hem., p. 365): "Corium: * * disc with a large pale yellowish-white triangular patch," while the ♂ of *fulvipes*, Reut., has only an external, mostly *very small*, and often scarcely distinct, white spot. Examining the descriptions, and also the figures, drawn and coloured by Fieber, I find also that there really exist three very closely allied species in Europe.

1. GL. SELECTUS, Fieb. (= *flavomaculatus*, Fall., F. Sahlb., Reut.). Vertex of ♂, as far as to the margin, convex; the margin in the middle carinate, carina arcuate,* the front very convex. Head of ♀ very globose, vertex emarginate, seen from the side, very convex, and *highly raised* above the eyes. Last two joints of antennæ paler. Eyes of ♂ and ♀ *remote* from the pronotum. Pronotum at the base about two and a-half (♂), or almost two-thirds broader than at the extreme apex before the calli; the calli in ♀ *very elevated*. Corium, behind the base, with a large triangular whitish patch, which, at the apex, is *emarginate*. The right forceps at the apex incurved, not, or scarcely, to the right, but to the left, almost at a right angle, and much prolonged; the prolongation with the margins almost parallel, the upper margin near the apex with small teeth.

* The carina rarely reaches almost to the inner margin of the eye; but in this case the species is also distinguished by the convex vertex, and by the eyes being remote from the pronotum; lastly, by the different structure of the right forceps. It is possible that the British specimens (described as *flavomaculatus*, by Douglas and Scott) are to be referred only to this variety, and not to the following species.—O. M. R.

2. GL. FLAVOMACULATUS, Fabr., Fieb., Dougl. et Sc. (?), = *fulvipes*, Saund. (?), = *cruciatus*, Reut.!: Vertex of the ♂ *almost flat*, margin carinate, the carina toward the eyes more obtuse and *curved*. Head of ♀ with the vertex convex and *rather slightly raised* above the eyes. Eyes in the ♂ *scarcely remote* from the pronotum. Pronotum at the base two and a-half to two and two-thirds (♂), or almost twice as broad as at the extreme apex before the calli; the calli in ♀ *very elevated*. Corium behind the base with a large triangular *truncate* whitish patch. The right forceps in ♂ irregularly heart-shaped (*cordatus*), the right lobe shorter and broader, the left lobe longer, and with the margins almost parallel, the whole upper margin of the forceps (in the middle angular-emarginate), especially in the right lobe, with numerous small teeth.

3. GL. SALICICOLA, n. sp. (= *fulvipes*, Reut., nec Scop., nec Saund., = *flavomaculatus*, var. 1, F. Sahlb.): Vertex of the ♂ *flat*, the elevated margin *straight*, as far as to the inner margin of the eyes, vertex, before this margin, at each side with a *transverse impression*, front very *declivous*. Head of ♀ *slightly raised* above the eyes. Eyes in the ♂ *not remote* from the pronotum. Pronotum at the base two and two-thirds (♂) or almost twice (♀) as broad as at the extreme apex before the calli; calli in ♀ *low*, in ♂ *scarcely elevated*. Corium behind the base with a *small exterior* whitish spot, or wanting this marking (♂), or with a rather large* triangular *truncate* patch (♀, very rarely in ♂). Right forceps of ♂ large, irregularly triangular with acute angles, the left more acuminate and curved, the upper margin toward the angles with small teeth.

I name the first species *selectus*, Fieb., and the second *flavomaculatus*, Fabr., Fieb. From the short description of Fabricius, it is not to be elucidated which of the two species he has described; and I think it is, therefore, just to retain the nomenclature employed by Fieber, the first author, who has separated them. This is more probable because Fabricius indicates "Germania" as the country for his species, and both species occur there. In the north of Europe, is found only *selectus*, the *flavomaculatus* of Scandinavian and Finnish authors belonging to this species. Not having observed that Fieber's *flavomaculatus* differed from my *salicicola* (*fulvipes*, olim), I described the former species as new, under the name *cruciatus* (Öfvers. Finska Vet. Soc. Förh., xxi, p. 36, 10).

I have changed the name *fulvipes* to *salicicola*. *Cimex fulvipes*, Scop. (Ent. Carn., p. 134, 388), which I had before identified with *flavomaculatus*, Fieb., cannot be regarded as a *Globiceps*. Scopoli says in his description: "Niger; elytris corio fusco, basi apiceque albo; pedibus fulvis," and further: "Antennæ basi [= first joint] fulvæ. Alæ hyalinæ. Femora postice compressa." The ♀ is described: "Larva nigra; antennis fulvis, apice nigris; elytro abbreviato, coriaceo, albo: fascia nigra; pedibus fulvis." This description somewhat

* Smaller than in the preceding species.

accords with my *Globiceps*, but the elytra are indicated as 3 lin. long, and the species is said to live on nut-trees ("in *Corylo*"). In Carniola occurs *very plentifully*,* a species (found also in Silesia on oak), viz., *Allæonotus distinguendus*, H.-Schf., Fieb., Hem. Eur., p. 262, and I am convinced that this is the true *Cimex fulvipes*, Scop.; it must, therefore, to my mind, be named *Allæonotus fulvipes*, Scop. This is the reason for the change of the name *Globiceps fulvipes* to *Gl. salicicola*. A female of this last species was found by me on small *Salices*, near Culbin Sands, at Forres, Scotland, in the summer of 1876. It lives in Finland on *Salix rosmarinifolia* and *Betula nana*.

ACANTHIA versus *SALDA*, l. c., No. 188; vol. xvi, p. 172. I think Mr. Douglas has given good reasons for his opinion on the nomenclature of these insects: the name *Salda* may be employed for Fabricius' *Acanthia zosteræ*, *flavipes*, etc., and the name *Acanthia* be adopted for *Cimex lectularius*, Linn.

SALDA MARGINELLA, H.-Schf. (D. et S., Catal., 54, 10), is only the male of *S. saltatoria*, Linn. The sides of the pronotum are straighter in the ♂ than in the ♀.

SALDA VESTITA, E. M. M., vol. xvi, p. 173. I had regarded this species as being a variety of *S. pallipes*, but this is not correct. I have now examined specimens sent by Mr. Douglas to Dr. Sahlberg, and found that the species belongs to the line 2, l. c., p. 174: "the anterior tibiæ with the base and apex black, and in the middle a rather short line." After a careful examination and comparison with specimens found by me in Scotland, I am sure that *Salda vestita*, is not a variety of *S. saltatoria*, as Saunders regards it, but that it is the *macropterous* form of *S. stellata*, Curt. (*c-album*, Fieb.).† The markings of the elytra are the same, and the sides of the pronotum are straight, especially in ♂. I found three specimens in company with *stellata*, brachypt., which is very common in Scotland. In the macropterous form, the pronotum is wider posteriorly, on account of the expansion of the muscles of the wings. (The most part of the species of *Salda* are crypto-dimorphous, having the elytra and wings of the brachypterous form, yet not shorter, sometimes a little longer, than the abdomen).

* "Laibach, inter Rakik et Zirknitz, inter Adelsberg et Prevald frequenter, inter Klana et Sabizhe." Reuter, Verh. zool.-bot. Ges. in Wien, 1876, p. 85, 52. A large number of specimens, captured by Dr. Palmén.

† It seems necessary to say that the identification of *S. c-album*, Fieb., with *S. stellata*, Curt., depends not only on the description, but on actual comparison with the type in Curvis's collection.
—J. W. D.

SALDA PILOSELLA, Thoms. According to Mr. Douglas (Ent. M. M., xvi, p. 218), this species is regarded by Dr. Puton as only a pilose form of *S. pallipes*, but I think *S. pilosella* is a good species. It often occurs in company with *pallipes*, but it can at once be distinguished from it. The colour is very little variable; the bristly erect hairs of the head, pronotum, scutellum, and clavus seem to me to be good differential characters.

S. ELEGANTULA, Fall., is regarded by Dr. Puton (*l. c.*, p. 218) as the brachypterous hispid form of *S. cincta*, H.-S., but this cannot be approved. I have examined, in the Museum at Helsingfors, a *macropterous* specimen of *S. elegantula*, having the elytra covered with black bristly hairs, and the antennæ are distinctly thicker than in *cincta*.

SCOLOPOSTETHUS PILOSUS, Reut., is suspected by Dr. Puton (*l. c.*, p. 219) to be only a hispid variety of *S. affinis*, which latter is found by us only on nettles; while *S. pilosus* lives in damp places among fallen leaves, moss, &c.

Helsingfors: 11th March, 1880.

NOTES ON UNKNOWN OR LITTLE-KNOWN LARVÆ OF MICRO-LEPIDOPTERA.

BY E. L. BAGNOT.

(continued from Vol. xvi, p. 273).

Platytes cerussellus, S. V.

The larva is unknown, but Anton Schmid once bred the moth from an unobserved larva in moss. The moth is fond of grassy banks and ditches, and flies abundantly in June and July.

Crambus alpinellus, Hb.

Larva unknown, the moth flies on dry sandy pasture lands, where heath, broom, and *Artemisia campestris* grow, in July and August. It is not an alpine insect, nor does it specially frequent fir woods.

C. verellus, Zk.

According to Anton Schmid, the undescribed larva feeds in moss on the branches of old plum, apple, and poplar trees, but Dr. Rössler finds the moth also in fir woods where the ground is covered with moss. The moth flies in July and August.

C. dumetellus, Hb.

The larva is unknown, the moth occurs on dry hill-slopes in June and July.

C. ericellus, Hb.

The moth, whose larva is unknown, flies on moors and heaths in alpine countries, and also in fir-woods where the sandy soil is moss-grown, in July and beginning of August.

C. silvellus (a), Hb., *adipellus*, Tr.

Larva unknown. The moth flies on boggy or damp mossy meadows, end of June, July, and August. Hübner's name has the priority. Treitschke imposed a new name, because there was already a *Tinea* bearing the name of *sylvella*, but as the modern classification places the two insects in very different families, and as it is generally admitted that two insects may bear the same name if in very distinct genera, even if they belong to the same group, the name given by Hübner must be maintained.

C. hamellus, Thnb.

The larva is unknown, and the imago is fond of sandy heaths among firs, and flies in July and August.

C. pascuellus (a), L.

Larva unknown, the moth flies commonly in June and July, in damp meadows, woods, and moors.

C. uliginosellus, Z.

Larva unknown, the moth flies in boggy meadows in June and July.

C. furcatellus, Zett.

The larva is unknown. An alpine or northern species which frequents grassy mountain slopes in July and August.

C. margaritellus, Hb.

The moth flies commonly in June, July, and beginning of August in damp boggy meadows or woods. Larva unknown.

C. myellus, Hb., *conchellus*, Tr.

The larva has been described by Treitschke, but as he confounded *myellus*, Hb. with *conchellus*, S. V., it would be desirable to have a fresh description. The larva would feed, according to Treitschke, in galleries under moss on stones in March. The moth appears in June and July, and affects the borders of woods.

C. latistrius, Hw.

The moth is fond of dry sandy localities on the coast, and inland among heath, and flies in July and August. The larva is unknown.

C. perlellus, Sc.

Larva is still unknown. The moth flies in damp meadows from the end of May to August, and even in September. Koch supposes that there may be two broods.

C. warringtonellus, Stt.

This is considered a variety of *perlellus*; it flies in the same localities as the type in July and August.

C. fascelinellus Hb., *aridellus*, Z.

The larva feeds on the roots of *Triticum junceum* and other grasses, for the moth occurs as well inland in dry sandy districts as on the coast. I mention this species here because it has been confounded with *spuriellus*, H.-G. (*pedriolellus*, Dup.), which is quite a different species and found only in the Alps. M. Guenée (Annales Soc. Ent. de France, 1843 Bull. p. xli) describes *fascelinellus*, and the mode of living of the larva, under the name of *pedriolellus*, Dup., hence no doubt the error which has crept into the "Manual."

C. inquinatellus, S. V.

The moth has been bred by Schmid from an unobserved larva on *Barbula muralis*. The moth flies in dry fields and heaths, end of July and in August.

C. cantaminellus, Hb.

The larva is unknown, the moth flies in dry fields in July and August.

C. culmellus, L.

The moth flies abundantly in fields from June to August, but the larva is unknown.

C. craterellus (*rorella*, L.).

The larva is unknown, the moth is common in dry fields and pasture lands, from the end of May to July.

C. cassentiniellus, Z.

Is, I think, rightly considered to be only a variety of the preceding species.

C. lithargyrellus, Hb.

The larva is unknown, the moth flies in dry sandy places and heaths in July and August.

Eromene ocella, Hw.

Larva unknown, the moth flies in June, but the earliest captures of this species in England were in early spring (March), showing that the insect hibernates. Mr. Sydney Webb met with a fresh specimen at Folkestone on the 4th August, 1879.

Schænobius mucronellus, S. V.

The larva is undescribed, but is stated to feed in stems of reed (*Arundo phragmites*) in June, the moth appears in July.

(To be continued).

Observations on the last moult of the larva of Stauropus fagi.—Though the earlier moults of this curious larva have been described as occurring with comparative ease, and observed to occupy no more time than from ten to fifteen minutes, or at most half an hour for the penultimate moult, there yet remains the *last* moult for me to offer some account of, which happens at night, and is altogether a much more protracted and exhausting operation.

Specially for this purpose the Rev. Bernard Smith, of Marlow, kindly provided me in the seasons of 1876—77 with several examples of the larva, feeding on beech, but with each of them in turn I unluckily failed to witness the last moult, from my inability to continue on the watch sufficiently late at night.

However, thanks to another generous friend, the season of 1879 brought a further opportunity with a larva of *fagi*, feeding, this time, on oak, very kindly presented to me by Mrs. Hutchinson, of Leominster, and this was destined to compensate for my previous mischances, as eventually I was able to see the whole of the last moult, to my great satisfaction, and bring the larva to maturity.

It was on the 3rd of September when I happened to notice the larva had fixed itself midway between the leaves on an oak twig, in preparation for its last change of skin; whereupon I placed the twig standing erect in a short bottle having a very small neck, and then, by cutting away the lower leaves from the twig, secured an unobstructed view of the larva, which had probably been so fixed thereon all the previous day, as it already had a double headed appearance, from the real head being mostly within the skin of the second segment; it was grasping the twig with the four pairs of ventral legs and all the front segments were stretched arching backwards over the erected broad segments of the tail, thus forming a more or less circular position.

Occasionally, though at long intervals, the fore parts of the body would be gently raised up and down a little, sometimes varied with a kind of convulsive heave, and once, after many hours' stillness, the anterior legs were extended laterally to their utmost stretch, quite rigid for a couple of minutes and were then gradually refolded; quite late at night the tail segments hung down a little but soon were erected again.

Next morning and throughout the day the first pair of ventral legs and the second pair partly, sometimes wholly, were withdrawn from the twig, the hold of the larva being sustained then by the third and fourth pairs which brought the head down lower than before on one side or the other of the tail; as night drew on all the anterior legs were outspread to their utmost.

In early morn of September 5th, I beheld it in the same posture as in the previous night, though about noon the head was even still lower, and with the fore part of the body turned away a little on one side from the tail, and in course of the afternoon suddenly changed over to the opposite side; thus, with slight variation of detail, for the remainder of the day and evening continued the wonderful exhibition of muscular power and endurance.

At 10.35 p.m., the larva seemed getting restless and continued to swing itself partly round on the twig, still in the same circular posture, and in a minute or two swung back again, and then commenced, gently at first, writhing backwards and downwards, soon with increasing energy; the anterior legs having lately been folded together now began to alternately relax outwards and contract again inwards close to the body, in what soon became a regular recurring rhythmic movement in unison with

the heavings of the breast, until within twenty-five minutes of the event expected, when suddenly most violent writhings and rapid twistings ensued for the space of two or three minutes, and then the slower measured movements were resumed; the skin enveloping the head became glistening and throbbed in parts with a slight inflation, in accord with the general heaving action of the larva; presently a series of very violent struggles occurred with the anterior legs extended laterally; these efforts proved effectual, for then at 11.35 p.m. the expected moment came, when the skin suddenly burst all round the throat, as it seemed then to be, close to the old head-piece.

Immediately there appeared a transverse yawning rent, exposing the whitish head and tender glistening bases of the short first pair of legs, held back at the moment by their sheathing of old skin, which drew quickly from off them, when they fell forward in their natural position; the same measured heaving to and fro movement continuing with incessant energy as the old skin (rapidly blackening) drew back and next exposed the basal joints of the second or longest pair of legs, whose long femurs were soon uncovered, yet before their tibiae were freed the third pair of legs being a little shorter and of unequal lengths, were drawn out from their sheathing and slipped forward, first one, the shorter of the two, then the other, and next were liberated the tibiae and tarsi of the long second pair, all playing immediately after in unison with the whole body which now unbending sustained its hold of the twig by one ventral leg only of the fourth or hind pair, and while the old skin glided backwards by degrees the other ventral legs were in turn slowly stepping out as it were of their old stockings, at this time the long front crustacean-like legs began impatiently to play about and push at the old head-piece as cleverly as arms and hands, to weaken the attachment and free the mouth parts, and from them the old helmet fell away just as the second pair of ventral legs were uncovered.

Meanwhile the hinder segments of the body had become drawn out straight and narrowly cylindrical though tapering, the caudal filaments drawn close together forming apparently but one projecting point which now with the hinder portions of the body became elevated almost perpendicularly, as the fore parts with the head and anterior legs were lowered in contact with the mouth of the bottle, evidently feeling for the leaf which had been previously cut away as before mentioned, the third pair of ventral legs were next uncovered and then one of the fourth pair, when as the moment approached for the only supporting leg to let go its tenacious hold of the twig, I instantly held a silk handkerchief round the neck of the bottle just as the leg was removed and the old skin drawn back from it, and then the larva lay sprawling and trembling on the mouth of the bottle as the shrivelling skin drew off from the eleventh segment, and after a few efforts to hold itself on the bottle slipped off upon the soft surrounding material, whereon for two minutes it remained perfectly still, and made the first pause from incessant motion established so long; refreshed with this it then turned partly round and vigorously thrust and pushed with its mouth and arm-like legs at the old collapsed skin on the twelfth segment which soon became freed excepting the caudal filaments hidden within the retreating skin: now it lay at full length with the hinder segments slightly turned aside, all the ventral legs sprawling, the anterior ones extended forward in freedom, motionless, sleeping apparently for fourteen minutes, and then vibrated the front legs a little, slowly turning the head round, threw out the longest pair of arm-like legs beyond the head, one bent partly over the other like a tired out athlete enjoying repose in

perfect abandonment; for there seemed something very human in the expressively weary attitudes assumed while it again stretched itself with a slight change of position and slept for four minutes more; it then awoke and shook the tail segments which yet remained comparatively narrow, when suddenly the exuviae fell away disclosing the two perfect filaments; thus at 12.50 a.m. was this moult completed, having from the rupture of the skin to this final riddance occupied one hour and a quarter.—WILLIAM BUCKLER, Emsworth: May 6th, 1880.

Insects in Japan.—It is very evident I shall have little time for correspondence as spring comes on, and summer follows, as I have been almost entirely engaged in collecting and setting this month, although the greater part of it has been a series of storms of rain or snow. I have already got much material, but nothing grand yet. I found *Panagæus rubripes* and *Leistus laticollis*, which were wanting to my cabinet before, and I have about 7 new *Geodephaga*, all obscure species. From Hakodate, I have 4 or 5 others, and *Cychnus convexus*, given to me by a Japanese, so I have no doubt the *Cychnus* is common up there. I have made arrangements to be taken in at Hakodate on the 1st July, for 2 months. *Sympiezocera* is out here now and feeds in rotten *Cryptomeria japonica*. The *Hemiptera* are evidently abundant, as I have carded about 60 species and seen others. *Carabi* are not out yet; I have only seen 2 specimens—1 *insulicola* and the common species. *Damaster* should be about now, I hear, but it requires search at night and is troublesome to get.

Japan is disappointing in many ways, one cannot eat the food of the natives and this involves taking "chow-chow" with you everywhere, a great impediment and expense for portage. I have a passport for the 13 adjacent provinces and can go anywhere I like, but the idea of exhausting the Nipon-fauna must be abandoned—the country teems with species in every quarter—and it is too much for one person.

About 13 species of hibernated butterflies are seen in the warm parts of sunny valleys, and I shall get a few later.

Fusiyama must be seen to be appreciated; no wonder the Japanese pray to it. I am going up on to the plains on which its base rests, about the 15th of next month, for some early spring things and then again in June.

Nikko is the great place every one says for beauty, insects and primeval forests, it is 90 miles north of Tokio (no one speaks of Yedo now): we go to Nikko in June for 2 weeks before going to Yezo.

Rosalia Batesi, Har., is common here, in Yezo and Sikoke, and so is distributed evidently. Yokohama is the worst place in Japan for an Entomologist, you cannot get away from it under 4 or 5 miles, and then you find yourself close to some beach or other, no road takes you comfortably inland amongst moist woods and vegetation.

I was working at old pine "stools," as Turner called them, all yesterday with a heavy hatchet.

The *Elaters* are already just under the bark and will come out with the first burst of spring.

There are numbers (in species) of *Trichoptera* about, but they require too delicate handling to admit of preservation.

About 10 days ago I got some nice things at Mionoshta, a place in the hills 30

miles off. You can put your hand into the hill-side amongst the ferns and shrubs, and burn your fingers in the scalding water, or look down and see steam in jets mingling with the water-falls: the baths there are much frequented.—GEO. LEWIS, Grand Hotel, Yokohama: *March 27th*, 1890.

Note on Coniopteryx lutea, Wallengren.—This little-known species was described by Wallengren in his *Skandinaviens Neuroptera*, pt. i, p. 55 (1871). It possesses ample posterior-wings, and is thus allied to *tineiformis* and *aleyrodiformis*, but it especially differs in the neuration of the anterior-wings, the second sector being absolutely simple, whereas the first ends in two forks; moreover, there is a transverse nervule from near the beginning of the first sector to the second, and it is also larger, and the mealiness is described as yellowish-grey. He says two examples from Gothland are in the Stockholm Museum.

I have before me two examples of *Coniopteryx* that agree perfectly with the description, excepting that the mealiness can scarcely be termed yellowish; it is possible the original examples may have been discoloured by age. One of these is from Kuusamo in East Bothnia, Finland; the other from Hautaika, district of the Yenesei (68° 5 N.), North-western Siberia. Both taken by Dr. J. Sahlberg. They are larger than even *C. psociformis*. The antennæ are 24-jointed (Wallengren says about 25-jointed). This is evidently a boreal species, but there is no reason why it should not be found in Scotland.—R. McLACHLAN, Lewisham, London: *15th May*, 1890.

Elipsocus cyanops, Rostock, a species new to Britain.—Mr. J. E. Fletcher recently forwarded to me an example of this insect, one of three beaten by him from *Pinus sylvestris*, at the Old Hills near Worcester on August 13th, 1877, and June 10th, 1878. The species was described by Rostock, firstly in the *Entomologische Nachrichten*, vol. ii, p. 192 (1876), and secondly in the *Jahresb. Ver. Naturk. Zwickau*, for 1877, p. 99, from examples taken in Saxony. It is somewhat smaller than *E. Westwoodi* and *E. hyalinus*, and readily distinguishable by the body being wholly yellow, excepting the black (bluish in life, according to Rostock) eyes and ocelli, the antennæ (excepting at the base) and the tibiae and tarsi being more obscure. The wings are wholly hyaline with dark neuration and a yellowish pterostigma. It is most likely to be mistaken for *Cæcilus obsoletus*, but the 3-jointed tarsi at once distinguish it therefrom, the intermediate joint being apparently longer and more distinct than in *E. Westwoodi* and its ally.

Probably it is the insect that Hagen identified somewhat doubtfully with *Hemerobius flavicans*, Linné, *Fauna Suecica*, ed. ii, p. 384. No doubt *flavicans* represents some species of *Psocidæ*, but it cannot have been *cyanops* from the words "*Caput nigrum. Thorax nigricans*" (in the diagnosis the words are "*niger, thorace abdomineque flavis*"). I have types of *E. cyanops* before me.

There is yet work to be done in British *Psocidæ*, notwithstanding that most of the known European species have been detected here.—ID.

Corrections of Errors.—In my note on "*Parthenogenesis in Tenthredinidæ*," &c., vol. xvi, 269, two errors of nomenclature occur. For "*Nematus miliaris*" read "*Nematus curtispina*, Thoms.," and for "*Nematus pallidus*" read "*Nematus palliatus*, Thoms."—J. E. FLETCHER, Worcester: *May 14th*, 1890.

ON *MUSCA HORTORUM*, FALLÉN, AND ALLIED SPECIES.

BY R. H. MEADE.

It has been well said, that an Entomologist who aspires to be anything more than a collector or dabbler in science, must confine himself to the study of one Order of insects; and if he has but little time at his disposal, devote most of his attention to one family in that Order: he can only thus acquire an intimate and critical acquaintance with the characters of the species which it contains, or of their life history.

In many genera there are small groups in which the species bear such a close general resemblance to each other, that several species have been confounded together by the older authors. This has principally arisen from their neglecting to observe and record minute points of structure, such as the number and disposition of the hairs and spines on the legs, wings, or body of the insect; which are often exceedingly valuable specific characters, being mostly constant, and not liable to vary like size and colour.

The descriptions of the older Entomologists were also generally so brief, that they often apply equally well to two or three distinct species, and there is very little doubt that they frequently were so applied; the author confusing two or three species. Much learning has sometimes been brought to bear on this subject, in the endeavour to ascertain the precise species to which a name has been applied; but if this point can be cleared up at all, it must be by the examination of typical specimens preserved in Museums.*

It is to one small group in the restricted family of *Muscidæ* that I wish to direct attention. In our gardens and groves, and on the road-side hedges, a very common fly may be found of a blue-black colour, marked with white reflections, rather larger than the ordinary house fly (*Musca domestica*), which has been long known as the garden fly (*Musca hortorum*). Upon careful examination it will be found that two distinct species (both common in most places in England), have been confounded by all the older Dipterologists, and are still but imperfectly known, different authors who have distinguished them having described them by different names, in ignorance of the writings of others; so that the synonymy is in great confusion.

Robineau-Desvoidy, in his great work upon the Myodaires, published in 1830, first pointed out that there were several distinct species

* Meigen's collection of *Diptera* is in the Jardin des Plantes, in Paris; Macquart's in the Museum of his native city, Lille; Fallén's is in Stockholm.

in this group, and he made a new genus for their reception, which he named *Morellia*; he failed, however, to characterize the different species satisfactorily, and it was our own countryman Haliday who, retaining R. Desvoidy's generic name *Morellia*, first clearly separated the two common species which had been previously confounded. His account will be found in the Entomological Magazine for 1836. Macquart had previously (in 1833) described a well-marked smaller species in his "Diptères du nord de la France," which he named *curvipes*;* and he also noticed that there was another resembling *M. hortorum*, but he only noticed slight differences in colour, and copied R. Desvoidy's descriptions, which were too vague to be of any value. Dr. H. Loew fully described both the common species as well as another in 1857, and Professor Rondani also gave an account of them in 1862; but none of the authors I have mentioned agree as to the names which they give to the two common species, nor which of them should retain Fallén's original name. Walker, in the "Insecta Britannica," ignored Haliday's paper, only giving one species; and, as the descriptions of the latter author in the Entomological Magazine are very brief, and not now generally accessible, I hope it may not be without interest if I endeavour to describe the four species now included in R. Desvoidy's genus, and try to clear up the synonymy.

The larvæ of the two common species have been found in cowdung.

Genus MORELLIA, R. Desv.

Eyes naked, arista plumose, fourth longitudinal vein of wing bent outwards towards the third, in a rounded curve, so as nearly to close the first posterior cell, which terminates a little before the apex of the wing; posterior or discal transverse vein placed midway between the anterior or little cross vein and the centre of the curve of the fourth longitudinal vein. Shining blue-black flies, striped and tessellated with black and white, with the antennæ, palpi, and legs black. The species in this genus are coloured and marked in a very similar manner to *Aricia albo-lineata* (one of the *Anthomyiidae*), with which they must not be confused.

The species may be thus distinguished:

- A. Hind metatarsi with a cushion of short stiff hairs on their under surfaces, but not bearded, and hind tibiæ straight, or only slightly curved.
- B. Middle tibiæ without a basal tubercle in the males.
- C. Hind tibiæ straight, fore tibiæ simple.

Sp. 1.—SIMPLEX, Loew.

* This species has not been recorded as British, though it is not uncommon in England.

CC. Hind tibiæ of males slightly curved, fore tibiæ ciliated.

Sp. 2—*HORTORUM*, Fallén.

BB. Middle tibiæ of males with a bristly tubercle at the base.

Sp. 3—*PODAGRICA*, Loew.

AA. Hind metatarsi of males with a thick beard in addition to the cushion, and with hind tibiæ much curved.

Sp. 4—*CURVIPES*, Macquart.

1. *SIMPLEX*, LW. ♂ ♀. *Cærulo-chalybea nitida*; *thorax antice vittis tribus latis albidis*; *abdomen tessellis albidis, linea dorsali, maculisque indeterminatis nigricantibus*; ♂ *oculis sub-coherentibus, tibiis posticis subrectis, intus medio longe ciliatis*; *tibiis anticis intus nudis*; *alulæ, squamis inferioribus infumatis*; *alæ hyalinæ, venis longitudinalibus tertiis, basi setulosis* (♂ ♀); ♀ *oculis quartario capitis separatis*; *pedibus simplicibus*; *alulis albidis*.
Long. $2\frac{1}{2}$ — $3\frac{1}{2}$ lin.

SYN.—*Musca hortorum*?, Meigen, System. Besch., v, 73. *Curto-neura hortorum*?, Macq., Diptères du nord de la France, 148, and Ins. Dipt., ii, 276. *Cyrtoneura hortorum*, Rondani, Dipt. Ital., v, 213. *C. simplex*, Loew, Wiener entom. Monatschr., i, 45; Schiner, Fauna Austr., i, 596. *Morellia hortorum*, R. Desv., Dipt. des environs des Paris, ii, 636; Haliday, Entom. Mag., iv, 149. *M. importuna*, Haliday, Ann. of Nat. Hist., ii, 185.

Colour dark glossy black-blue: head black; ♂, eyes separated by a narrow black space contracted in the middle, where the eyes are almost contiguous. ♀, eyes separated by a space measuring one-fourth of the width of the head; ♂ ♀, sides of face glistening silvery-white, with black reflections; antennæ not quite reaching epistome, third joint twice the length of second, of a grey colour; arista thinly furnished with long hairs, which leave the apex bare for some length; palpi black, epistome slightly prominent, setigerous; facial groove bordered with bristles; cheeks clothed with short black hairs: thorax with three longitudinal, broad, glistening white stripes, most distinct on the front margin; the lateral stripes irregular in shape, and only extending backwards as far as the base of the wings; between the white stripes are two indistinct black ones on each side: abdomen of a glistening greyish-blue colour, sometimes with a glaucous tinge; it has a longitudinal black dorsal stripe, and is tessellated with black and white spots or rather reflections, which show differently when viewed in different aspects: legs with fore femora clothed in ♂ with soft short hairs along their outer sides, and ciliated in ♂ ♀, beneath with long stiff bristles of nearly equal length, placed at equal distances from each other like the teeth of a comb; fore tibiæ naked on their inner sides, and having only a row of short even hairs on their outer and under surfaces; middle femora with a few long stiff bristles on their upper sides near the tip, and with some long hairs on the under surfaces near the base; middle tibiæ evenly ciliated along their outer sides with a row of very short hairs; hind femora clothed along their exterior and under surfaces with long hairs, something similar to those under

the fore femora; hind tibiae nearly straight, slightly thickened in the middle, beset with bristles of unequal lengths on their outer sides, having a few long hairs on the lower half of their under surfaces in ♂ and ♀, and also a few long soft hairs on their inner sides, just below the middle in ♂; hind tarsi with a cushion of short stiff bristles of a brownish-yellow colour on their under surfaces: alulets with the upper or smaller valves half white and half grey, and the lower and larger ones of an uniform smoky-brown colour in ♂, with a yellowish marginal fringe, and dirty white in ♀: halteres yellow: wings clear, with black veins; third longitudinal vein with a small tuft of bristles at its base in ♂ and ♀, some of which extend a short distance towards the small cross vein.

This species is generally distributed throughout Europe; it is less common than the next in most parts of England and Ireland (Haliday), and also in Germany, but more general in Italy and probably in France.

It is very difficult to decide to which species to apply Fallén's original name, as modern authors differ so much on this point. Haliday, whose opinion is worthy of every respect, changed his mind upon the subject. In his original paper in the Entomological Magazine, in which he first pointed out the distinctive characters between this and the following species, he named the one I have first described *hortorum*; but in the second volume of the Annals he said that he was mistaken, and believed that the next species which he had before named *importuna* was the true *hortorum* of Fallén. I have already said that I have no doubt whatever that Fallén, Meigen, Zetterstedt,* and others, confused two species together, so that it matters little which of the two retains the original name; I have therefore concluded to follow Loew, the greatest modern authority on Dipterology, who gives the name of *hortorum* to that species which appears to be most common in the north of Europe.

2. HORTORUM, Fall. ♂ ♀. *Glauco-chalybea nitida*. Thorax et abdomen ut in *M. simplicie signata*; ♂ oculis paulo distantibus; femoribus anticis subtus extraque barbatis; tibiis anticis extra spinosis intusque villosis; femoribus mediis apice cristatis; tibiis posticis leviter curvatis, intus breviter villosis; alulis sordide albidis; alis, venis longitudinalibus tertiis, setis parvis armatis, ordine positis, inter basem venæ et venam transversam parvam. ♀ oculis tertia parti capitis separatis; pedibus simplicibus.

Long. 3—4½ lin.

SYN.—*Musca hortorum*, Fallén, Act. Holm. (1816), 252, 33, et

* Zetterstedt, in Dipt. Scand., describes his *Cyrtoneura hortorum* as having the eyes in ♂ "coherentes (non vero arctissimi)," et "tibiæ omnes rectæ"—both these characters apply to *M. simplex*; but he adds, "squammæ albes," et "femora antica extus in ♂ villosa"—both of which apply to *M. hortorum*.

Dipt. Suec. Muscid., 52, 33 ; Wiedemann, Zool. Mag. (1817), i, 183 ; ? Meigen, System. Besch., v, 73 ; Zetterstedt, Insect. Lappon., 660 ; Walker, Insect. Brit., ii, 113. *Cyrtoneura hortorum*, Zetterstedt, Dipt. Scand., iv, 1346 ; Loew, Wien. ent. Mon., i, 46 ; Schiner, Faun. Austr., 1, 596. *C. pilipes*, Rondani, Dipt. Ital., v, 215. *Morellia importuna*, Haliday, Ent. Mag., iv, 149. *M. hortorum*, Haliday, Ann. Nat. Hist., ii, 185. *M. agilis* ?, R. Desv., Myod., 405. *Alina agilis*, R. Desv., Dipt. envir. de Paris, ii, 639.

Colour and pattern the same as in *M. simplex*, but the abdomen has more frequently a green tinge: head—eyes of ♂ parted by a black space, which occupies about one-eighth of the width of the head, and is about twice as wide as the interval between the eyes of *M. simplex*; the space between the eyes of ♀ measures one-third of the width of the head, characters of the other parts of the head similar to those of *M. simplex*: thorax and abdomen marked as in *M. simplex*: legs with fore femora ciliated beneath with long stiff hairs, in addition to which (in the ♂) they are thickly bearded on the outer and under sides with soft hairs; fore tibiae of ♂ with a few long stiff spines on their outer surfaces near the middle and at the extremities, and with their inner sides clothed along the whole length with thick, soft, and rather short hairs; middle femora armed in ♂ with a tuft of short but stiff bristles near the tip; middle tibiae with a series of short erect little spines, placed irregularly along the upper half of the outer surface, and having the lower half of the same surface fringed with soft short hairs, as in *M. simplex*; hind femora with only a few long hairs on their under surfaces near the ends; hind tibiae slightly but distinctly curved inwards at their lower thirds, they have a thick row of short stiff bristles along their outer sides, and only a few short soft hairs on their inner and under surfaces; hind tarsi as in *M. simplex*: alulets dirty white, lower scale in ♂ having a brown tinge in the form of a ring, near the margin, the edge itself being fringed with pale yellow: wings clouded near the base with brown, which colour is conspicuous in the small basal cells: third longitudinal vein armed with six or seven small spines, which are arranged along the vein at nearly equal distances, and extend from the base to near the small cross vein in ♂ and ♀.

This species is rather larger than the former, and very common; the males may at once be distinguished from those of the preceding species by the tuft on the apex of the middle femora, by the wider space between the eyes, and by the anterior tibiae being hairy on their inner sides instead of the posterior ones, as in *M. simplex*; also by the spines on the wings. The females of the two species (which authors have failed to discriminate) may most readily be known from each other by the difference in width between the eyes, by the hind tibiae in *M. simplex* being clothed beneath with a few long hairs (which are absent in *M. hortorum*), and by the different armature of the third longitudinal veins of the wings.

3. PODAGRICA, LW. ♂. *Nigro-chalybea nitida, lineata et irrorata*

ut in *M. simplice*; *oculis sub-contiguis*; *pedibus anticis ut in M. simplice armatis*; *tibiis intermediis tuberculo hirsuto basi posito*; *tibiis posticis paulo curvatis, et extra ciliatis*; *alis subfuscis*; *alulis obscuris*.
Long. 4—5 lin.

SYN.—*Cyrtoneura podagrica*, Loew, Wien. ent. Mon., i, 45; Schiner, Dipt. Austr., i, 596.

♂. Colour shining dark blue-black, without any tinge of green: thorax and abdomen marked as in the two preceding species, but having the latter less tessellated with white: head as in *M. simplex*, the eyes near together, though not contiguous: legs, fore femora ciliated with a comb-like row of bristles on their under surfaces, as in *M. simplex*; fore tibiæ nearly bare; middle legs armed as in *M. hortorum*, and also with a bristly tubercle seated on the outer side of the head of the tibia; hind tibiæ a little curved, clothed with long soft hairs on their outer sides: alulets with the lower scale of an uniform brownish-yellow colour: wings tinged with brown at their bases and along the fore borders, the longitudinal veins also a little clouded; the third longitudinal vein armed at the base with a few spines, as in *M. simplex*: the ♀ is unknown to me.

This fly has not yet been found in Britain, but inhabits lofty mountains in Germany, where it is said to be not uncommon. It is the largest species in the genus, and is of rather a darker colour than the others; I have not seen a female, but my friend Mr. Kowarz, of Franzensbad, kindly sent me a male specimen.

4. CURVIPES, Macq. *Cæruleo-nigra nitida*; *thorace albo-lineato et abdomine cinereo-tessellato*; ♂ *tibiis posticis valde arcuatis*; *metatarsisque posticis barbatis*; *femoribus intermediis subtus in basi spinula erecta armatis*; *tibiisque intermediis inclinatis*. *Long. 2½—3 lines.*

SYN.—*Cyrtoneura curvipes*, Macq., Dipt. du Nord., 148, et Insect. Dipt., ii, 276. *Cyrtoneura curvipes*, Zett., Dipt. Scand., iii, 1347; Rond., Dipt. Ital., v, 215. *Camilla ænescens*, R. Desv., Dipt. env. de Paris, ii, 641.

This species varies a good deal in colour, it is less brilliant and less distinctly striped and tessellated than either of the preceding ones, though marked in the same manner; there is often a greyish, and sometimes an æneous tinge on the abdomen, and the thorax is less blue than black; the ♂ has the eyes somewhat widely separated; the fore femora are ciliated beneath as in *M. simplex*; the fore tibiæ simple; middle femora armed beneath at their bases with a single long strong spine, and with a few long bristles on their outer and under surfaces near their apices; the middle tibiæ have an angular bend in the middle, the lower halves being directed outwards, they are also ciliated along their whole outer surfaces with little stiff rough spines, similar to those seen in *M. hortorum* and *M. podagrica*; the hind femora are evenly clothed along their whole under surfaces with hairs of a moderate length, and have a tuft on their upper surfaces near the base; the hind tibiæ are rather long and strongly curved inwards; they are bare on their inner sides, with

the exception of two long, slender, curved bristles on each tibia near the apex; the outer surfaces are armed with spines of uneven lengths; the hind metatarsi, in addition to the usual cushions, have beards of strong, long, black hairs on their under surfaces, partially extending to the other joints of the tarsi: alulets nearly white: wings in some specimens tinged at the base and along the fore border with brown, in others clear; the third longitudinal vein is armed with a few little spines arranged in a row, as in *M. hortorum*: the ♀ is not known to me.

This well-marked little species is not uncommon in England, though rather local; I have received specimens from Mr. B. Cooke, of Southport, and have found the males plentifully near Bicester in Oxfordshire; I have not yet met with the female. Macquart and R. Desvoidy say that it is common in France; Rondani has found it frequently in Italy; Zetterstedt says that it is very rare in Scandinavia; and its capture has not yet been recorded in Germany, to my knowledge.

Bradford, Yorks :
May, 1880.

NATURAL HISTORY OF *BOTYS PANDALIS*.

BY WILLIAM BUCKLER.

Hitherto the early stages of this species have remained in profound obscurity, and now that I have become familiar with them I can understand why the larva, from its mode of life, had never been detected; therefore, my pleasure is all the greater in being able to render an account of it, which I owe to the discernment and kindness of my friend Mr. W. R. Jeffrey, of Ashford, who, on the 13th of June, 1879, captured a female *pandalis*, and with hope of obtaining eggs confined her in a jam-pot, together with leaves of several *Compositæ* and *Labiata*, yet not an egg was deposited on any of them.

However, two days later Mr. Jeffrey found several eggs had been laid on the inside smooth surface of the pot and five more on its piece of plate-glass cover, looking for all the world like splashes of moisture that should be wiped off at once, but the next moment with keen intuition he knew they were *ova*; and though wishing to send some directly to me, he afterwards very wisely resolved not to risk forwarding the piece of glass, but to pay attention to them and their produce himself, till they were fit to travel, and to furnish me with his observations, which here follow.

“When first laid on 14th and 15th June the eggs were flat, scale-like, but more translucent than any I have observed, like minute drops of fluid or oil; under the microscope the shell is seen to be reticulated

and beautifully iridescent; on the fifth day the embryo was distinctly visible, on the eighth day the ocelli could be seen, on the tenth the mandibles plainly, the segmental divisions and dorsal canal slightly, and on the twelfth day the black head and plate on the second segment showed most plainly, indeed, the slow undulating movement in the alimentary canal could be distinctly traced; about 10 o'clock the same night, June 27th, they began to hatch, and the little larvæ were all out of the shells before next morning.

"The colour of the larva when first hatched is creamy-white with black head and plate. Fortunately I had growing plants of *Solidago virgaurea*, *Origanum vulgare*, and other species, from which I at once gathered leaves to see what they would take as food; but at first they were too restless, crawling upward and trying to escape from under the glass cover of the pot; but next day I noticed one larva had attacked a leaf of *Solidago* by eating a small hole partly through it; subsequently other leaves were similarly eaten into, and by the beginning of July they evidently preferred the golden rod and marjoram."

With this account Mr. Jeffrey kindly forwarded to me a dozen of the larvæ on the 3rd of July, just as they had completed their first moult, and were then not quite a tenth of an inch long, having a glossy black head and collar-plate, a whitish pellucid skin, bearing blackish-brown dots, and a broad yellowish-green internal vessel showing through.

On the 8th of July I found they had moulted for the second time and become less transparent, excepting the belly which remained much as before though slightly yellower, while the body above was darker and rather dingy green, the head, the plate and dots shining brownish-black.

They lived contentedly but well apart from each other, and when preparing for the third moult spun little hammock-shaped silk webs on the under-side of the leaves, or between leaves slightly uniting the surfaces.

After the third moult, on July 17th, I was at first astonished at not seeing the larvæ, until I became aware that they were inhabiting little cases, which they had made for themselves with portions cut from the leaves of their food plants; some of the cases were lying loose among the leaves, though one or two at first were still adhering to the leaves by a small part not cut away; on turning out a larva two days later I saw its back and sides were deeply tinged with dark purplish-brown.

Henceforward the larvæ were not easily observed, as they were

exceedingly shy, never protruding their heads to feed during the day unless in darkness and perfectly undisturbed; they evidently fed well, and made fresh cases whenever they required roomier abodes or those in use changed colour from decay; indeed, the leaves of *Clinopodium*, *Origanum*, and *Solidago*, from which they constructed them, were not of a nature to last long in a good condition; it therefore seemed probable that in complete liberty the larvæ would use any more suitable leaves for case making they might happen to find; and to test this idea I introduced some leaves of beech with their food, and they were not slow to appreciate this better material, as one larva after another constructed a new residence, and before long they were all occupying cases cut from beech.

On one occasion I chanced to surprise a larva, three parts grown, lying along the midrib on the upper surface of a beech leaf, engaged in spinning a great number of silk threads, close together and parallel, from one side to the other as a foundation for a new case,—I had only just observed this, and that the sides of the leaves were drawing upwards, when I was called away for a little while,—and on my return found a large oval piece of the leaf the size of a pigeon's egg had been neatly cut out and drawn closely together at the edges into a well fashioned elongate, plump, pasty-like case, having a circular hole of egress at both ends; all the cases were of similar form, and varied but little in size after the last were made, nearly an inch long by almost three-eighths across the broad middle.

Latterly, indications appeared of some of the larvæ being nearly or quite full-fed, as I found some cases attached by silk threads to the marjoram and basil, when I added a few leaves of *Teucrium scorodonia*, and this the few still feeding appeared to relish so much as to care but little for their previous diet; all but one were full fed by 9th of September, and that last one on the 19th: they had moored their cases, destined for puparia, to some of the neighbouring leaves with threads of brownish silk; and one hole of each case had disappeared by the edges being drawn closely together, the other hole evenly plugged up with silk; in one instance the case was strongly moored near either end across the under edge of a beech leaf from which a large oval piece had been cut away as material for a similar construction, an interesting example Mr. Jeffery gave me to figure.

Most unexpectedly, when I chanced to look into their cages on the 16th of November, I found in one a ♀, apparently just out of pupa, and in another found a second ♀, equally perfect, while at the bottom lay a dead ♂ specimen partly discoloured.

This season, 1880, I bred a male specimen rather crippled on May 27th, and this afternoon a fine female, the remainder no doubt retarded by ungenial weather.

The full grown larva is seven-eighths of an inch in length, of moderate slenderness, cylindrical, though tapering very little from the fourth segment to the head, and again only at the end of the thirteenth, all are plump and well defined, with a transverse wrinkle across the back of each; the ventral legs shortish, the anal pair extending behind: the colour of the back and sides as far as the spiracular region is very dark grey tinged more or less with purplish-brown, the dorsal line still darker, the glossy head of the same dark colour is marked with black in front of each lobe, a black glossy plate dorsally divided with dark grey is on the second segment, and on either side of the third and fourth are two faintly paler longitudinal lines gradually lost beyond them, the tubercular spots large, black, and glossy, each with a fine hair; below the small round black spiracles the whole surface is rather light greenish-grey or drab and the spots there are brownish-grey.

The pupa is half an inch long, rather slender, of pyraloid character, with the back of the thorax and abdominal upper segments very slightly keeled, the head parts moderately produced, the wing covers long and well defined, the tapering hind part of the abdomen having a flattened taper prolongation and blunt extremity, furnished with minute curly-topped bristles; in colour dark purplish-brown with the lower abdominal divisions golden-brown, the wing covers glistening, all the rest glossy.

Emsworth: June 5th, 1880.

DESCRIPTION OF THE SPECIES OF *MACROPIS*.

BY W. H. PATTON.

MACROPIS CILIATA, n. sp.

♀. Length, $\frac{1}{8}$ to $\frac{1}{5}$ in., expanse, $\frac{1}{8}$ to $\frac{1}{4}$ in. Black; the head closely punctured, and having a thinly scattered short white pubescence; mandibles piceous at the tip; flagellum beneath fulvo-testaceous, a short fringe of hair on the inner side of the scape; the eyes in freshly-killed specimens of a dull green, with varying longitudinal stripes or spots. Thorax closely punctured, the base of the metathorax very minutely punctured and not shining, pubescence on the sides of thorax and beneath, as also a line on each side of the scutellum, white, the pubescence on disc of thorax very short and thin; wings sub-hyaline, shaded at apex, tegulae and nervures black, stigma piceous. Apical joint of all the tarsi dark piceous, joints two to four of the anterior and three and four of the intermediate tarsi fulvous, joints two to four of the posterior tarsi pale testaceous; a ferruginous stripe on the intermediate tarsi beneath, and a stripe of white hairs on the intermediate tibiae and base of the first

joint of the intermediate tarsi above. Posterior tibiæ, except the glabrous enclosure at base, and the basal joint of the posterior tarsi, except at tip, clothed externally with white pubescence, that on the basal joint of the tarsi beneath fuscous; claws yellow at the base; calcaria pale testaceous, those of the posterior tibiæ arising close together. Abdomen shining, delicately punctured; a little white pubescence at the base, very delicate continuous white fasciæ at the base of segments two to five, visible only when the abdomen is extended, a narrow white fascia at the tip of the third and fourth segments, widely interrupted on the third segment, and scarcely interrupted on the fourth; the fimbria on the fifth segment white. The glabrous enclosure on the sixth segment black or piceous, and with a smooth border. The apical margins of the ventral segments testaceous, and clothed with griseous pubescence.

Numerous specimens taken at Waterbury, Conn., on the flowers of *Lysimachia ciliata*, from July 3rd to 22nd; of *Rhus glabra*, from July 22nd to August 7th; and of *Archangelica hirsuta*, August 14th.

Var.—The base of metathorax without punctures and shining, the tegulæ dark piceous.

One specimen taken at New Haven, Ct., on the flowers of *Rhus typhina*, July 2nd; and one specimen taken at Waterbury, Ct., on the flowers of *Lysimachia ciliata*, July 22nd.

Var.—Differs from the preceding variety in having the tegulæ testaceous.

Two specimens taken at New Haven, Ct., on the flowers of *Rhus typhina*, June 21st.

Var.—No hairs on the clypeus, tegulæ dark piceous, base of metathorax without punctures and shining, scutellum fringed behind with griseous hairs, the ferruginous stripe under the intermediate tarsi not extending upon the first joint, basal joint of posterior tarsi with fuscous hairs externally upon its apical half, the white fasciæ upon the abdomen obsolete, the fimbria mostly fuscous, and the apical margins of the ventral segments dark piceous.

Two worn specimens taken at Waterbury, Ct., on the flowers of *Lysimachia ciliata*, together with a specimen of the typical form, July 17th.

♂. Length, $\frac{7}{16}$ in., expanse, $\frac{1}{8}$ to $\frac{1}{6}$ in. Antennæ nearly as long as the head and thorax; flagellum fulvo-testaceous beneath; the scape entirely black, with a fringe of white hairs on each side, and with shorter hairs in front; second joint of the flagellum narrowed at base, and scarcely longer than the first, third joint scarcely one-half the length of the second, as thick as the apex of the second, joints four to eleven each equal in length to joints two and three taken together, but not so thick as the third joint, last joint a little longer than the eleventh. The face below the insertion of the antennæ, and a spot at the base of the mandibles, yellow; labrum black; pubescence on head and thorax longer than in the female, white; thorax shining, punctured, base of metathorax polished and without punctures; tegulæ testaceous; nervures and stigma testaceous; pubescence on legs white, that on the

basal joint of all the tarsi beneath, as well as a line under the four anterior tibiæ, golden-rufous; apical joint of all the tarsi dark piceous, joints two to four paler; posterior coxæ with a short curved spine at the tip, within; posterior tibiæ subtriangular, the lower face produced at the apex into a three-toothed process, the exterior tooth the longest, and forming a spine, the middle tooth shortest, blunt; calcaria whitish, the point of the anterior calcaria not so long as in the female, the posterior calcaria unusually remote, arising from the bases of the outer teeth of the process, the exterior tooth about two-thirds the length of the corresponding spur; the lower face of the basal joint of the posterior tarsi flattened, expanded within and glabrous. Abdomen shining, clothed with a scattered white pubescence, which is more dense on the sides, the depressed apical margins of the segments polished, the apical margins of the third and the four following segments with a narrow white fringe, that on the third segment interrupted, on the fourth slightly interrupted. Abdomen beneath very smooth, the apex of the third and fourth segments with a single, slightly arcuated, row of golden hairs, the end of each hair regularly curved; the apex of the fifth segment with a similar, but less regular, row of hairs; the visible portion of the sixth segment forming an angle with the concealed portion, triangular, the two posterior sides margined with a short dense golden pubescence. The exterior claps of the forceps expanded and deeply emarginate at the tip.

Described from five specimens taken at New Haven, Ct., on the flowers of *Rubus villosus*, June 22nd; and one specimen taken at Waterbury, Ct., on the flowers of *Cornus paniculata*, July 4th.

MACROPIS PATELLATA, n. sp.

♂. Differs from *M. ciliata*, ♂, in the following particulars:—

Joints five to twelve of the antennæ each slightly shorter than joints three and four taken together, making the antennæ as a whole slightly shorter than in *ciliata*. Labrum yellow. Base of the tibiæ with a yellow spot externally, which, in the posterior legs, extends upon the tips of the femora. Ciliation of the ventral segments white. The process at the apex of the posterior tibiæ represented by the exterior tooth only, forming a stout, obliquely-truncated, projection, reaching to the middle of the exterior spur; the calcaria not so remote as in *ciliata*; the lower face of the basal joint of the posterior tarsi slightly sinuous within, but not expanded. Exterior claps of the forceps broadly cleft, forming two narrow lobes. The retracted ventral segments present other distinctions.

Taken by Mr. H. F. Bassett on the flowers of either *Cicuta* or *Rhus* at Plymouth, Ct., August 1st; and by me on *Lysimachia ciliata* at Waterbury, Ct., July 9th.

A female specimen taken with the males differs from the typical females of *M. ciliata* in no respect, except that the fimbria on fifth segment of abdomen has a golden tinge and the tegulæ are dark piceous.

As the males of *ciliata* and *patellata* differ in those characters only which are peculiar to that sex, it seems not unlikely that the females,

which present no such development of characters as the males, may be undistinguishable. The males must be considered typical of the species. But it may be that the first form of the ♀ described above, under *ciliata*, belongs in reality to *patellata*, for in ♂ *patellata* the base of the metathorax, although it is not opaque, is not so brilliantly polished as in ♂ *ciliata*.

Fabricius, in describing *Megilla labiata* and *fulvipes*, gave no differences between them, excepting such as are now known to be sexual. The points of difference which appear in the descriptions of authors who have subsequently described *Macropis labiata* are such that it is evident that more than one European species exists; yet, on account of the brevity of the Fabrician descriptions, there is nothing at variance with them, excepting locality and the colouring of the hair of the thorax, which Fabricius described as *ferruginous*. Examining other descriptions, we find that the hair of the thorax has been described as "ferruginous" in Austria, "fulvous" in Germany, "pale fulvous" in England, "griseous" in Germany and Scandinavia, "cinereous" in Finland. The German species, with fulvous thorax, Schenck called *fulvipes*, Fabr., that with griseous thorax he called *labiata*; but, *labiata*, Fabr., and *fulvipes*, Fabr., being the same, unless a re-examination of the types proves them distinct—and, in that case, Schenck has transposed the names—Schenck's *labiata* requires a new name. The descriptions of the French species by Latreille and Dufour I have not at hand, and, consequently, cannot determine the relationship of *Andrena lagopus*, Latr. Lest it should prove to be the same as *labiata*, Schenck (♀ = *labiata*, Panz.), and have priority, I omit to give a name for Schenck's species. The labrum, scape, and mandibles in the male of both the German species have been described as black. In Sweden, the labrum and a spot on the mandibles are yellow; in England, a spot on the scape and a spot on the mandibles are yellow. Whether these differences indicate distinct species can only be determined by the study of more essential characters in the European species. The colouring of the labrum is a specific character in separating the American species. The descriptions of the English and Swedish authors afford no characters in regard to the delicate puncturing of the abdomen, the colouring of the posterior legs in the female, and the armature of the posterior tibiæ in the male. Schenck has indicated differences in these respects as follows: *labiata*, Sch., ♀, posterior tibiæ with white hairs, metatarsus black; *labiata*, Fabr., ♀, posterior tibiæ with white hairs externally, with golden hairs within and beneath, metatarsus brown above, with golden hairs within and

beneath, abdomen more finely and sparsely punctured. According to Nylander, who examined the types of Fabricius, the metatarsus of *fulvipes* type is, excepting the apex, clothed with yellow hairs, thus differing from both of Schenck's species, but agreeing less with his *labiata* than with his *fulvipes*.

The form from Southern Finland mentioned by Nylander (Adnt., ex. mon. Ap. Bor., p. 249) also resembles the latter, having the "scopula fulvous."

Taking Schenck's characters for the German species, the following synopsis will enable the *males* of the known species of the genus to be distinguished.

LABIATA, Fabr. Tip of hind tibia drawn out beneath into a tooth, before which is another small blunt tooth.

LABIATA, Sch. A slight emargination on the inner border of the hind tibia before the tip, the tip not drawn out into a tooth.

CILIATA. Lower face of hind tibia produced at apex into a short three-toothed process.

PATELLATA. A stout, oblique, truncated projection from the tip of the hind tibia beneath.

Waterbury, Connecticut, U.S.A.

NOTES ON BRITISH *TORTRICES*.

BY C. G. BARRETT.

(Continued from vol. xvi, page 244).

Asthenia scopariana, H.-S. This very pretty species (new to Britain) has been reared by Mr. J. B. Hodgkinson from larvæ found by him at Dutton, near Ribchester, Lancashire, but, by an unfortunate oversight, the food plant is not certain. Most probably it was the common broom, but no doubt the discoverer will remedy the oversight by next season. The moth is closely allied to *cosmophorana* and *coniferana*, as well as to *splendidulana* and *strobilella*. It is placed by Wocke between *corollana* (*Heegerana*) and *cosmophorana*, and by Heinemann between the latter species and *Zebeana* in the vast genus *Grapholitha*. In Wilkinson and Stainton's arrangement, it should follow *cosmophorana* in the genus *Asthenia*; in Doubleday's it might be placed in either *Coccyx* or *Stigmonota*.

A short description of the moth may be useful—

Fore-wings dark olive-brown from the base to beyond the middle, thence pale golden-brown; markings pale silvery, consisting of three pairs of short costal streaks (sometimes with additional costal spots between them), the first pair nearly or quite uniting with a slender, upright or slightly curved dorsal streak, the second pair also nearly uniting, with an oblique curved streak, which reaches the anal angle, and the

third pair similarly nearly uniting, with a *perpendicular* streak, which also reaches the anal angle, passing outside the ocellus, which contains three or four black streaks. Hind margin edged with a deep black line, which is interrupted below the apex by a silvery blotch. Cilia pale silvery-grey. Hind-wings of the male pale grey, with the base whitish, the apical angle white, a deep black line along the hind margin, and a white blotch inside it; of the female darker grey, with the white apical angle and deep black marginal line. Cilia whitish. Head and antennæ dark grey, palpi paler.

This species has not hitherto been recorded in the United Kingdom, but is found in Germany, Galicia, Livonia, and Servia. It does not seem to have been previously reared, but nearly every author records it as occurring among *Spartium scoparium* or *Genista*, in woods or wood-meadows. Its time of appearance is April and May.

Eupæcilia atricapitana, Steph. I find that the early summer brood of this species is produced from larvæ which feed in the autumn and winter in stems of *Senecio jacobæa*, causing a slight distortion of the stem, and that they remain in the burrow until the spring, frequently spinning up and assuming the pupa state therein, but in some cases leaving the stem to spin up elsewhere. The moths emerge in May and June.

Some of the distorted dry stems were gathered for me this spring at Eastbourne, Sussex, by Mr. W. H. B. Fletcher, and I afterwards found a few in the quarries here. Moths have emerged from both.

Eupæcilia udana, Gn. In Ent. Mo. Mag., vol. xi, p. 191, I quoted a description of the larva of this species made by M. Ragonot, from specimens preserved in spirits. This description I can now compare with one made from a living larva kindly sent me by Dr. Wood, of Tarrington, Ledbury.

Moderately plump and rather thickest in the middle, dull yellowish-pink or pinkish-brown, greyer towards the head, dorsal line faintly greyish-brown, spots shining, hardly visible, hairs very minute, head and divided dorsal plate bright black-brown, anal plate pale brown.

Feeding within the dry flower-stem of *Alisma plantago*, full-grown about the middle of October, eating the pith and leaving frass scattered irregularly along the burrow. Pupa chestnut-brown, with dark brown wing-sheaths. In a slight cocoon of white silk, placed inside the dry stem of *Alisma*, not occupying the whole width of the burrow, but attached to one side, and having a hole cut nearly through the bark for exit. Through this the pupa pushes its way before the moth emerges.

On receiving a larva from Dr. Wood, I went to a little pond at a corner of a lane for some *Alisma*, and there found two or three larvæ. *The species had not previously been observed in this neighbourhood. The moths emerged in June, July, and August.*

Eupæcilia notulana, Z. Along with the last species Dr. Wood sent me some larvæ of this, from which I took the following description :—

Smooth, stout, nearly cylindrical, but with the segments slightly swollen in front, inactive, naked, pale yellowish-green, greener when young, dorsal vessel visibly brownish, spots indistinct, grey. Head and divided dorsal plate shining black, anal segment and plate very pale brown.

Feeding in October in stems of *Mentha hirsuta*, apparently entering at a joint and working upwards, feeding on the pith, and leaving the lower part of the burrow tightly packed with excrement. Hibernating within the stem, and generally spinning up therein, but occasionally deserting it to spin elsewhere. Pupa light brown, in a cocoon formed of white silk and frass, forcing itself out before the moth emerges in June.

Lord Walsingham found larvæ of this species feeding in the same manner in stems of *Lycopus europæus* at Wicken Fen. The moth in this case emerged in July.

Eupæcilia ciliella, Hüb. Through the kindness of my old friend Mr. Sang, I have been enabled to secure a description of the larva of this species, which I append, as it differs slightly from those already published :—

Plump, sluggish, shining, shortly tapering at the anal extremity, white, with hardly visible spots, naked, except a few hairs towards the hinder end, head and dorsal plate shining jet-black, anal plate very small, pale brown, on the back of the ninth segment is a distinct reddish-brown internal blotch. When full-grown it becomes tinged with pink.

Feeding in August on the seeds of the cowslip (*Primula veris*), leaving the seed vessels, when full-grown, and spinning up in hollow sticks or dead stems, where it hibernates, assuming the pupa state in the spring. Pupa light brown, with darker brown wing-sheaths, protruding from the cocoon before the moth emerges—in June.

Argyrolepis zephyrana, Tr. Larva one-third of an inch in length, broadest at the second and third segments, and tapering to the anal extremity, with segments deeply divided and ridged, yellow, spots barely visible, hairs minute, head rather broad, pale brownish, with a brown line in front of each eye enclosing the mouth, which is dark brown, plates shining pale yellow. In the autumn and winter, in the stems of *Daucus carota*, eating out the pith and filling the space with frass, still feeding in the dead stems, or working back through the frass, as late as April, and spinning a very slight brownish cocoon in the tightly packed mass of frass in the stem. Pupa very pale yellowish-brown, extruded from the stem, and often falling out when the moth emerges—in June.

For the opportunity of describing this and the following species, I am indebted to a kind friend who collected them for me in Cambridgeshire.

Lozopera Francillana, Fab.

Larva short, plump, cylindrical, dirty yellowish-white, head black, dorsal plate faintly brown, with two dark brown spots at the posterior edge, anal plate small, faintly brownish with a dark spot in the middle.

Feeding in the autumn and until April in the stems of *Daucus carota*, eating the pith and filling the space with frass, through which it seems to work back in the spring. It appears also to make small cocoon-like chambers in the frass, and then abandon them, but ultimately spins up in the stem and becomes a light brown pupa, which pushes itself through the bark of the stem when the moth emerges: this takes place in July and August.

My remark in vol. xi, p. 196, that the larva had been reared from seeds of *Daucus carota* seems to have been a mistake. At the same time I quoted from M. Jourdhueille's Calendar: "Larva in dead stems of *Eryngium campestre*," and remarked that this must refer to another species. A short while ago, M. Ragonot sent me four beautiful specimens of *flagellana*, Dup. (giving *eryngiana*, Heyd., as a synonym), telling me that they were reared from dead stems of *Eryngium campestre*. These specimens differ from *Francillana* in being less glossy and of a more ochreous yellow, and in having the first oblique fascia abbreviated and slightly clubbed at the apex, with a spot opposite it on the costa, while the second fascia is more curved, attenuated in the middle, and often has a short row of dots outside it. This species seems constant in its markings, and is intermediate between *Francillana* and *Smeathmanniana*.

Heinemann (p. 80) gives *flagellana*, H.-S., as synonymous with *Francillana*, Fab., and Wocke includes *flagellana*, Dup., as well as *flagellana*, H.-S., under *Francillana*, Fab., but he gives *eryngiana*, Heyd., as a distinct species. I have no opportunity now of ascertaining whether Duponchel's and Herrich-Schäffer's *flagellana* are the same species, but I think there can be no doubt that *flagellana*, Dup., should be separated from *Francillana*, F., as a distinct species, with *eryngiana*, Heyd., as a synonym.

Pembroke: 16th June, 1880.

Stigmonota scopariana, a *Tortrix* new to our list.—This very handsome species I bred the last week in April and first week in May. I had no idea of my prize, in fact, at first I thought they were only very big *Lithocolletis ulmifoliella* until I chloroformed one and then saw it was a *Tortrix* which at the time I set down as *Coecyx splendidulana*, until I took them to Preston to compare, and at once saw I had a puzzler. I sent one to Mr. Stainton, who did not know it, then I sent it on to Mr. C. G. Barrett, he wrote me what he thought it was, but wanted to see both sexes; I then sent him both sexes, and he at once wrote me they were *Stigmonota scopariana*. I imagined the larvæ had been obtained from mountain ash, but the name *scopariana* at once made me think whether I had ever been among broom, as it is scarce at Dutton; there are some broom bushes about 50 yards from my house which I beat only once and put any larva in along with those I beat among mountain ash, &c., so most likely the pabulum of this gem is the broom. I bred six specimens in all.—J. B. HODGKINSON, 15, Spring Bank, Preston: June 13th, 1880.

OCCURRENCE OF THE NEUROPTEROUS GENUS *DILAR* IN SOUTH AMERICA.

BY R. McLACHLAN, F.R.S., &c.

I have for some time had in my collection an insect belonging to the singular genus of *Neuroptera-Planipennia* first made known by Rambur under the term *Dilar*, taken by the Rev. T. A. Preston in the neighbourhood of Rio Janeiro in November, 1872. As this genus is altogether new for the South American Fauna, its occurrence in that Continent is an interesting fact in Geographical Distribution, and it is well that its representative there should be characterized.

DILAR PRESTONI, n. sp.

Body blackish-fuscous, varied with testaceous or yellowish. On the disc of the head, above, are two very large median, sub-contiguous, rounded elevated tubercles, placed somewhat obliquely, and in front of these a single still larger, somewhat conical tubercle;* on the sides of the disc, toward the eyes, the head is depressed and excavated. Antennæ dirty whitish, the short stout basal joint and the second somewhat testaceous: the succeeding joints (up to the 9th, the rest broken off) are slightly longer than broad, each with a dusky ring at its apex; the third has a short branch, all the others a long, stout, straight branch, somewhat dusky, and rather pubescent, gradually increasing in length, so that the branch of the 9th joint is seven or eight times the length of the joint itself, and that of those preceding only slightly shorter. Palpi and legs pale yellowish-white, the latter strongly pubescent. Abdomen very obtuse (the anal parts not capable of definition). Wings pale whitish-hyaline, slightly iridescent, densely and transversely reticulated or chequered with pale grey markings; neuration fuscous, with long blackish hairs: in the anterior-wings the first four or five costal nervules are simple, afterwards a forked nervule and a simple one alternate, and there is a marginal rudiment between each and in each of the forks; principal sector 6-branched, the branches furcate or bifurcate, and each branch also ends in a minute marginal fork with the usual intermediate marginal rudiments; two nervules between the sector and the radius, the other transverse nervules very few in number; a dusky horny point between the first and second branches of the sector: in the posterior-wings the neuration is similar in arrangement; the sector is 6-branched, but the branches have mostly only the minute marginal fork.

♂. Length of body, about $2\frac{1}{2}$ mm. Expanse, $10\frac{1}{2}$ mm.

Remarkable for its very small size as compared with the species of the Old World; but it appears to be absolutely congeneric, differing only in the lesser number of transverse nervules in the wings. It deceptively resembles the species of a group of European *Psychidæ*.

Lewisham, London: May, 1880.

* These protuberances were mistaken by Rambur for ocelli, an error duly pointed out by Hagen in the *Stett. ent. Zeitung*, 1866, p. 292.

DESCRIPTION OF A NEW SPECIES OF *TORMYUS* FROM SCOTLAND,
WITH NOTES ON OTHER BRITISH SPECIES OF THE GENUS, &c.

BY P. CAMERON.

TORMYUS CAMPANULÆ, *sp. n.*

Green or bluish-green, pilose; antennæ black, the scape on the under-side yellow; the 2nd joint of the flagellum slightly longer than broad. Legs yellowish, the greater part of the coxæ and of the posterior femora green; the four anterior femora with a greenish line on the outer side, and slightly brownish on the other side; posterior tibiæ fuscous, except at base and apex; the apex of tarsi fuscous; the calcaria short, scarcely a third of the metatarsus in length. Abdomen compressed, longer than thorax; ovipositor as long as abdomen and two-thirds of the thorax.

The ♂ has the scape green on the under-side, and agrees otherwise in coloration with the ♀, except one specimen, which has the head, thorax, posterior coxæ, and abdomen suffused with bronzy splashes. The wings are hyaline; the costa with a hair-fringe.

Length, 2—3 mm.

Of the species in my collection it comes closest in coloration and length of ovipositor to *T. hibernans*, Mayr, but it is a narrower insect, the abdomen is longer compared with the thorax, and more compressed, the antennæ longer, and the spurs much shorter.

Bred in July and August from the galls of *Cecidomyia campanulæ*, Müller; found in various parts of Clydesdale. Dr. Gustav Mayr has kindly examined specimens, and has confirmed my opinion as to its being an undescribed species.

Tormyus viridis, Förster, Beitr. z. Mon. d. Pter., 1841, p. 32; Mayr, Verh. z.-b. Ges. Wien, xxiv, p. 123, 4; I find this near Glasgow in galls of *Rhodites eglanteriæ*.

Tormyus tipularum, Zett., Ins. Lapp., 1840, p. 420; Mayr, *l. c.*, 111, 27; Thoms., Hymen. Scand., iv, 95, 26; = *Tormyus pumilus*, Ratz., Ichn. d. Förstins., i, 1844, p. 180; this I have bred here from the rose galls of *Cecidomyia rosaria* on willows.

Tormyus sodalis, Mayr, *l. c.*, 120, 36, I found last October ovipositing at Milngavie in the galls of *Neuroterus lenticularis*. The ovipositor was inserted at the side, under the flat projecting part of the gall, which was then a little swollen. It would seem to be a good species, and readily distinguished from the other spangle-gall *Tormyus (hibernans)* by its shorter ovipositor.

Tormyus juniperi, Linné, Fauna Suec., 408, 1635, *sec.* Mayr, *l. c.*, 109, 23, I reared this spring in abundance from the galls of *Hormomyia juniperina* collected last year on Clober Moor. It is apparently identical with *T. amethystinus*, Boh., Vet. Ac. Handl., 1833, p. 370; and Thoms., Hymen. Scand., iv, 85, 10.

Torymus caudatus, Boh., Vet. Ac. Handl., 1803, p. 365, *sec.* Thoms., Hymen. Scand., iv, 84, 6, has been sent me by Mr. J. E. Fletcher, who reared it from fir cones collected in the hopes of rearing *Coccys strobilana*. Mayr (*l. c.*, p. 100) considers *caudatus* to be a variety of *azureus*, Boh., in which opinion I am inclined to agree with him, for the two forms (*azureus* and *caudatus*) appear to merge together when we examine a large number of specimens, while they both frequent fir-cones. *T. azureus* is the form which I recorded Trans. Ent. Soc., 1879, p. 119. It has the ovipositor shorter than in *caudatus*, and generally the colour is violet and not obscure green, as in the last mentioned. Thomson regards them as two distinct species.

I find that these insects are much better examined by setting them on silver wire than by carding them, as is usually done in this country. Not only are much better results obtained by this method, but much time is saved the student, the sticking of a wire through an insect taking up far less time than spreading out its legs, wings, &c., by means of needles and gum on cardboard; while, not unfrequently by the latter method, unless great care be taken to display the various parts, the form of the joints of the antennæ and legs cannot satisfactorily be made out; it may be owing to the employment of too much gum, or to the parts not being displayed sufficiently. The method is very simple. All that is required is to get silver wire* of the thickness required, cut it up in lengths (say 4 lines each), taking care to cut off the points as obliquely as possible; stick one of these through the thorax of your insect; then insert the wire with the insect on it in a piece of pith (that of the Jerusalem artichoke will do), which may hold only one insect or several, according to taste; finally, place an ordinary pin through the piece of pith, and, by means of it, stick the whole in the cabinet. If all this be done properly, no part of the insect need be disturbed, which would certainly be the case if ordinary pins be employed for the smaller species.

I do not, however, mean to say, that carding has no advantages. The above remarks refer only to *Chalcididæ*. I have not succeeded so well with *Oxyura* and parasitic *Cynipidæ*, owing to their much harder and smoother bodies; these insects are not easily pinned, the wire generally slipping off, while the successive attempts to insert it usually lead to the destruction of the insect. Such, at any rate, has been my experience; but no doubt, with greater experience, the difficulty might be got over. My views on the comparative advantages of carding and pinning *Hymenoptera* I have stated elsewhere (Proc. Nat. Hist. Soc. Glasg., 1877, p. 144), so I need not refer to the subject here.

Glasgow: May, 1880.

* Silver wire of any thickness may be had from Corney & Co., 70, Little Britain, London, W.C.

Carabus clathratus, ♀, in Ireland.—It is well known that this grand *Carabus* is no rarity in some parts of Ireland, though it is certainly not a species of common occurrence in England (judging from the few specimens I have seen in collections). At Teelin Bay, Co. Donegal, I took more than 40 examples, in less than an hour's work, on the evening of April 28th. They occurred under loose stones on the tops of turf walls, in a rather boggy place of very limited extent. With them and in the immediate neighbourhood of their locality I found *Carabus granulatus* (abundant), *violaceus* (a few), *Calathus melanocephalus* var. *nubigena* (less than 100 feet above the sea level), *Staphylinus erythropterus* (in numbers), *Silpha subrotundata* (13), *Cryptohypnus riparius* (common), &c.

C. clathratus has also occurred to me at Dinish Island (Co. Galway) and near Westport, but very sparingly in both these localities.—JAMES J. WALKER, H.M.S. "Hawk," Galway: May 20th, 1880.

Lithocharis castanea, Gr., near Wimbledon.—A single specimen of this rare beetle was captured by me at the roots of heather near Cæsar's Camp, Wimbledon, at the end of last March. I have since then visited the same place several times in hopes of finding another, but hitherto without success.—W. J. SAUNDERS, Wray House, Wimbledon: June, 1880.

[The late Mr. Keeley took this species in the road leading from Wimbledon Common to Wandsworth.—E. C. R.].

Occurrence of Tachinus rufipennis, Grav., near Barnstaple.—I found a specimen of the above beetle at Filleigh, near Barnstaple, by shaking roadside rubbish over paper in February last; the weather was very cold and wet, or I might possibly have found more. Its shining red elytra with black tips distinguish it easily from any of the other species of the genus. I believe it has only been taken twice or three times in England before.—EDWARD SAUNDERS, Holmesdale, Upper Tooting: June, 1880.

Is the number of moults of Lepidopterous larvæ constant in the same species?—I have been impressed lately with the uncertainty that seems to exist as to the number of times Lepidopterous larvæ moult in the course of their growth, and have been considering whence this uncertainty springs. Does it arise from the difficulty of watching each individual, when one is rearing a brood from the egg? For though all the larvæ may be hatched on the same day, some are sure to outstrip the rest in growth, and so one is apt to get confused in the reckoning. Or is it quite certain, as many certainly think, that the number of moults varies in the same species?

Boisduval in his Introduction to Tome 1 of *Lépidoptères* (Suites à Buffon) says "Le nombre des mues varie peu dans une même espèce, et peut-être même dans l'état sauvage est-il toujours constant. Mais chez quelques chenilles velues, que l'on élève en captivité, il peut-être augmenté ou diminué par une nourriture plus ou moins abondante:" this passage is the plainest assertion I can find of this variation in the number of moults, and the writer gives a reason for it, but I have also noticed that other writers state that they *thought* (they do not speak positively) there was no constancy in the number of moults undergone by the individuals of the same brood—reared altogether under the same conditions; but I do not myself like to agree to this view until I can have some good proof of it.

I know that the number of moults certainly varies in different species; I have

myself made sure that six is the number for some, and nine for others as in the instance of *Nola centonalis*; but I never recorded so few as one, the allowance which has been meted out to *Sphinx ligustri*,* nor so many as ten or twelve, the number with which *Chelonia caxa* and *Lithosia caniola* have been respectively credited.

Any one, who has made notes on which he can depend about the growth of any species he has reared, would I think do good service by publishing them, even if he has nothing else to say about the larvæ; and those, who are just about to take fresh broods in hand, would help to settle the question for each species, if they would isolate examples of each brood, and accurately record the changes noticed. I know this would be troublesome, but I do not see how otherwise we can get upon sure ground in this matter: I should be glad to see records of the commonest things—*M. brassicae*, *S. lubricipeda*, or *M. fluctuata*—so that they were accurate.

Daily inspection will be needful, and the approach of a moult and its accomplishment may at once be known by the appearance of the head of the larva; before the moult it seems too small and stretched forward from the neck—after the moult it comes out in extra width as compared to the second segment, with its colours distinct.—WILLIAM BUCKLER, Emsworth: June 10th, 1880.

Vanessa cardui double brooded.—Most entomologists have commented upon the extraordinary appearance of *V. cardui* in 1879, advancing various theories as to whether many of them did not migrate from the continent to this country. Concerning this I do not wish to give an opinion; I only know that the swarms that began to appear in this neighbourhood about the middle of August were certainly bred in the country, coming out as they did, without a sign of travel upon them, during the few hot days which occurred at that season. And these, moreover, corresponded with the unusual numbers of larvæ which were to be found upon the thistles at the end of July. They were in far greater numbers than I ever remember having noticed before. The larvæ then found were feeding on the full-grown thistles, nearly always high up the stem, and near the flowers. Soon after these had completed their changes, and had emerged as beautiful insects in the imago state, there came some high winds off the sea, and withered the thistles, which, by that time, had run to seed, and thus the chance of finding more larvæ appeared to have passed away. About the 1st of October, however, and for the next fortnight, I began to find them again, but not in their former situation. These new larvæ were on the young seedling thistles which remain, without shooting up, flat upon the ground till next season. On the back of the leaves, lying close to the surface of the ground, I found several young larvæ, some half-a-dozen of which I kept and fed up, and others I gave away. I had some curiosity to ascertain when these unseasonable little creatures would arrive at maturity, as the weather was then cold, and might at any time have changed to frost. Between the 18th and the 20th of October, most of them changed into the pupa state, and, on November 20th, one of them emerged as a perfect *V. cardui*, in every respect as fine as those hatched in August. The rest failed to come to maturity. These facts, I think, seem to prove that in some cases this insect was double-brooded last year: whether they are usually so I will not venture to say; but these late ones, from the time they appeared in the larva state,

* N.B.—Albin records of a brood of *Sphinx ligustri*, which he reared from the egg, that they moulted four times in their course.

and from the situation in which they were feeding, after the original food-plants had been destroyed, must, I think, have been produced from eggs laid by some of those which were swarming around us in August; and, late as they were, they refused to pass the winter in the pupa state.—CLENELL WILKINSON, Castlemartin: 16th June, 1880.

[Is not this an indication of an instinctive attempt at following up the habit of the species in a hotter climate, where two broods in the year are possible and usual?—C. G. B.]

Description of the larva of Ephestia ficulella.—Along with the larvæ of *Plodia interpunctella* received from Mr. J. R. Wellman, on the 21st December, 1878, and already described in this journal, were several of an *Ephestia*, from which, on the 27th of August following, a single specimen was bred, agreeing perfectly with an example in my cabinet named *ficulella*.

Length about half an inch, and of average bulk; head highly polished, it has the lobes rounded, and the mandibles prominent; body cylindrical, tapering anteriorly, the head being the narrowest segment; there is a distinct polished plate on the second segment behind the head, and a small similarly polished space on the anal segment; skin very glossy and rather wrinkled.

The ground colour a pale pinky-flesh, varying in depth of colour in different specimens; head and mandibles dark sienna-brown; frontal plate still darker brown, almost black: dorsal, sub-dorsal, and spiracular lines all very distinct, and about equal in width, pink; and there is still another, but a narrower, of these pink lines, below the spiracles; spiracles minute, dark brown; tubercles large, raised, and polished, very dark brown, in some specimens nearly black.

Ventral surface greyish-white, with a faint pink tinge; legs and prolegs tipped with brown. Feeds on dried figs.—GEO. T. PORRITT, Highroyd House, Huddersfield: June 5th, 1880.

Nemophora pilella in Lancashire.—Last season I took a longhorn among *Vaccinium*, high up on the moors at Green Thorn about a mile above Stoneyhurst College; I suspected it was *N. pilella*, but only having one specimen to look at I had to let it stand over; but to show how eyes vary in seeing differences, or rather in not seeing the most striking and positive characters in determining those differences, I may note a keen careful eye like C. S. Gregson's could only make the specimen in question a ♂ of *Metaxella*, whereas H. T. Stainton made it into *Schwarziella*, but I still thought it ought to be something different on account of the situation being so totally at variance with where *Schwarziella* occurs. Well, this season I was determined to settle the question, and towards the end of May I set off again in quest of more specimens and to see the habits and general ways of the supposed *pilella* or a new species. I took a score of specimens of both sexes in splendid condition, flying in the hot sun, most actively starting up from among the *Vaccinium*, and when soaring up into the fir trees they looked almost like worn *Adela viridella*, giving them quite a green shining tint; the flight first of all in general appearance settled me they were no *Schwarziella* and no *Metaxella*, I take the latter among alders about 2 miles lower down. In the next place, just get *pilella* into your net and it wants all the wind you can spare to blow it back in the net to box it, and when boxed it runs about as

rapidly as *Tinea pellionella* in the box. I watch them carefully through the glass-topped boxes, those habits conclusively put *Schwarziella* to one side. I sent six to Mr. Stainton, both sexes, in fine order, he writes me they are *Nemophora pilella*, a species that has been taken in Glen Tilt, and at Rannoch, Scotland, and among *Vaccinium*, in Germany; now that he sees a fine series, not having before seen many specimens, he has no doubt mine are this species, the main and most distinctive difference being the dark under-wings which are quite of a purplish black, I may add there are no other plants for the larva to feed on but *Vaccinium* and fir, little or no heath grows beneath the fir trees; I never had this species before, and what I have seen under this name in collections are only *Schwarziella*; even *Schwarziella's* forewings are not as rounded as those of *N. pilella* nor yet so scaly; it comes near *Metazella* in general appearance.—J. B. HODGKINSON, 15, Spring Bank, Preston: June 13th, 1880.

Strange habitat for the larva of Batrachedra præangusta.—On the 10th inst., I received from Lord Walsingham a healthy living larva of this species, which he had found in a nest of a goldfinch. Lord Walsingham writes thus:—"In the lining of a goldfinch's nest I found to-day the larva sent herewith. At first it puzzled me much, but when I saw the lining of the nest was made of the cotton-like down from the willow catkins, I recognised the larva of *Batrachedra præangusta*. During the last two seasons I had searched more than once for this larva to send you, but in vain".

The occurrence of larvæ in birds's-nests is nothing unusual, as they are the natural habitat of *Tinea lapella* and possibly of some other species of the genus *Tinea*; but in the present instance the larva was a *foreign body accidentally introduced*, and no doubt the larva itself helped to explain to Lord Walsingham of what materials the lining of the nest was really composed, for the larva of *B. præangusta* is so remarkably conspicuous that any one who has once seen it can hardly fail to recognise it wherever met with.—H. T. STAINTON, Mountfield, Lewisham, S.E.: June 12th, 1880.

Eidophasia Messingiella at Hökendorf, near Stettin.—On the 16th instant (I was then on a visit to Dr. Dohrn, at his residence at Hökendorf), I went in the forenoon to a locality where I knew that the larva of *E. Messingiella* was to be found on *Cardamine amara*. Though we had had a long period of dry weather, I found it just as moist in the alder-woods as usual. I remained there sweeping the low herbage (though much tormented by midges) for two hours and collected upwards of 100 larvæ, of different sizes, of *Eidophasia Messingiella*. To-day about a score have spun up and two are already in pupa.—P. C. ZELLER, Grünhof, near Stettin: May 21st, 1880.

Mamestra pomerana, at Misdroy on the Baltic.—My friend Professor Hering has made two excursions lately. He and Herr Büttner were at Misdroy on the Baltic, where they obtained from under the roots of *Artemisia maritima*, buried in the sand, about 150 pupæ of *Mamestra pomerana*. (I do not know whether this species has yet been detected in England). At the same place they also found a number of larvæ of *Agrotis præcox*.—Id.

[*Mamestra pomerana* is described by G. Schulz in the Stettin. ent. Zeitung, 1869,

p. 51; Staudinger refers the insect as a variety to *Mamestra Leineri* of Freyer (N. B. 184, 3). It may be worth searching for on our Eastern coasts, where *Artemisia maritima* grows freely.—H. T. S.]

Coccyx Ochsenheimeriana near *Thetford*.—I have met with six more specimens of *Coccyx Ochsenheimeriana* here lately among *Abies cephalonica*. Their habit appears to be to fly about 4 o'clock in the afternoon in the sunshine, at the ends of branches of the above-named fir.

I rather hope to breed them another year from the cones, if, as I fancy, their habits are similar to those of *C. strobilana*. It is a beautiful little species, but very scarce. I have worked many days for them lately and have had men looking for them for the last three weeks, with only the small result which I have mentioned.—WALSINGHAM, Merton Hall, Thetford: June 14th, 1880.

Argyresthia ævariella (Stainton, *Ent. Ann.*, 1871, p. 100, and 1874, p. 25) bred.—From larvæ collected last August at the Brushes, near Manchester, feeding in the berries of mountain ash, I have just bred a series of *Argyresthia ævariella*. Plenty of *A. conjugella* are emerging, but no intermediate forms have yet appeared; *ævariella* is certainly a species, the males and females copulate freely, but never yet have been observed to do so with *conjugella*. I am sorry to say that this insect is not likely to be abundant.—J. H. THRELFALL, 4, East Cliff, Preston: June 2nd, 1880.

Discovery of the winged form of Prosopistoma punctifrons.—On the 7th inst. I received a hurriedly-written post-card, dated the 5th, from Dr. Emile Joly, of Marseilles, announcing the fact that his colleague, M. Vayssière, had just shown him a bred sub-imago of *Prosopistoma punctifrons*, which proved to be one of the *Ephemeridæ*, of small size, with four wings and three caudal setæ. Thus, the persistent energy of Prof. N. Joly and his son, and of M. Vayssière, has solved a mystery that has existed since 1762, when Geoffroy first described the aquatic condition as "Le Binoële à queue en plumet," which subsequently found itself located by Latreille in the *Crustacea*, under the name *Prosopistoma punctifrons*. The entomological public awaits with natural impatience fuller details of this most interesting discovery.—R. McLACHLAN, Lewisham, London: 18th June, 1880.

The generic name Pachymerus in Hemiptera.—In vol. xvi, p. 260, I said that "*Pachymerus* is not available in *Hemiptera*, unless it can be shown that Latreille and Amyot and Serville were in error."

Dr. Puton replies (*Bull. Ent. Soc. France*, No. 8, 1880, p. 83) by repeating his former statement that *Pachymerus*, Lep. et Serv. (*Hemiptera*), has priority over *Pachymerus*, Latr. (both dated 1825), because it is cited by the latter author, and this, notwithstanding, he has just before, in the same work, used the name for a genus of his own; and Dr. Puton further says that Amyot and Serville were mistaken as to dates, and accepted as prior a name which at the time (1825) was unpublished. Now, I put the matter hypothetically, because I gave Latreille credit for knowing what he was about, and was only employing a name he had previously brought into use; and I naturally believed that Amyot and Serville also were sure of their statement concerning the priority of Latreille's genus and their consequent

deposition of that of Lep. and Serv. Dr. Puton, however, says that when I can quote a work of Latreille, prior to 1825, in which he established the genus *Pachymerus* in *Coleoptera* he will be of my opinion. It rests on Dr. Puton's inference that such a priority does not exist, that the name *Pachymerus*, Lep. and Serv., must be revived in *Hemiptera* and *Pachymerus*, Latr., be suppressed in *Coleoptera*.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: May 22nd, 1880.

Review.

THE GEOLOGICAL ANTIQUITY OF INSECTS, twelve papers on Fossil Entomology: by HERBERT GOSS, F.L.S. London: John Van Voorst, 1880, 50 pp. 8vo.

Mr. Goss, with a view (as we believe) to rendering them known amongst Geologists as well as amongst Entomologists, has reprinted and published (in a cheap separate form) the series of papers by him that appeared in Vols. xv and xvi of this Magazine, with such additions and corrections as appeared necessary. The combined papers constitute a very useful outline sketch of what is known, and of what has been done, in a special branch of palæontology, and cannot fail to be useful, especially for the copious bibliographical references.

Obituary.

Professor Kirschbaum.—On the 2nd March last, Dr. Carl Ludwig Kirschbaum, Professor at the Gymnasium at Wiesbaden since 1848, died at the age of 68 years. In the "Entomologische Nachrichten" of the 15th April is a long biographical notice extracted from the "Niederrheinischen Zeitung," by which it appears that he was for 25 years Inspector of the Natural History Museum at Wiesbaden, and that he was highly esteemed in his own country and honoured in others. To Entomologists in general he is known by his "Die Rhynchoten der Gegend von Wiesbaden, Die Capsinen," 1855; "Die Athysanus-Arten der Gegend von Wiesbaden," 1858; and "Die Cicadinen der Gegend von Wiesbaden und Frankfurt a.M.," 1868. These works have their merits and demerits; the errors of identification, re-description of known species as new, &c., being due in a great degree to want of research and communication with contemporary workers.

ENTOMOLOGICAL SOCIETY OF LONDON, April 7th, 1880.—H. T. STAINTON, Esq., F.R.S., &c., Vice-President, in the Chair.

The following were elected ordinary Members, viz.:—Messrs. C. G. Bignell, of Stonehouse, Plymouth; W. D. Cansdale, of Witham, Essex; Frank Crisp, LL.B., Secretary Royal Microscopical Society, and the Rev. W. W. Fowler, M.A., F.L.S., of Repton, Burton-on-Trent. Mons. E. André, of Beaune, was elected a Foreign Member.

Mr. Carrington exhibited a pale variety of *Arctia caja*, bred by an experimenter as to the effects of coloured glass with reference to variation; there was no reason to believe in any correlation between the variety exhibited and the conditions under which it was bred.

Mr. Rothney communicated "Notes on the attraction the Dahlia causes to insects in North India," as opposed to remarks by Mr. J. W. Slater, at the meeting

on April 2nd, 1879. Mr. Rothney found the *Dahlia* very attractive to almost all kinds of insects which never suffered from any narcotic or otherwise injurious effects.

Mr. Cameron communicated "Notes on the coloration and development of insects."

Professor Westwood communicated "Notes on gynandromorphous examples of *Cirrochroa Aoris*, an Indian butterfly, and on *Cetonia aurata* and *Protactia Bensoni*."

5th May, 1880.—H. T. STANTON, Esq., F.R.S., &c., in the Chair.

Mr. Peter Inchbald, of Hovingham, Yorkshire, formerly a Member, was re-elected.

Mr. W. C. Boyd exhibited a pale variety of *Nyssia hispidaria*, ♂, recently taken at light at Cheshunt Station.

Mr. Walhouse exhibited sundry Geodephagous *Coleoptera*, found at a great altitude in India.

Mr. Distant exhibited a long series of *Ptyelus Goudoti* from Madagascar (allied to our common Cuckoo-spit insect), illustrating the great variation that exists (as in *Pt. spumaria*). The larva was known to emit a frothy secretion, and in such quantities, that it dropped from the trees like rain.

Mr. Billups exhibited two living examples of *Carabus auratus*, found in the Borough Market, London, and believed to have been imported from Belgium.

Mr. Pascoe said he had lately heard it asserted that a *Sphinx* with a haustellum sufficiently long to reach the nectary of *Anagræum sesquipedale* of Madagascar, had been recently discovered, and asked for confirmation of this. No Member present was able to confirm the statement.

Miss E. A. Ormerod, in presenting a copy of the "Cobham Journals," drawn up from observations on the correlation of meteorological influences with the condition of animal and vegetable life, made by Miss Molesworth at Cobham, Surrey, over a period of about 44 years (1825—1850), remarked on the necessity of combined action in making public similar observations in future.

2nd June, 1880.—SIR JOHN LUBBOCK, BART., M.P., &c., President, in the Chair.

Miss G. Ormerod, of Isleworth, and Mr. H. Lufton, of Chapel Allerton, Leeds, were elected Members.

Mr. Walhouse exhibited a collection of moths formed by himself at Mangalore, on the Malabar coast.

Mr. Finzi exhibited (on behalf of Mr. Lowrey) an example of *Arctia fuliginosa*, in which one antenna was congenitally absent. The President stated that he had occasionally bred ants with only one antenna, and one example with no antennæ, this latter being helpless when out of the nest.

The President exhibited an Australian ant, allied to *Camponotus*, remarkable for having its abdomen enormously distended (resembling that of a gravid queen Termite), so that it was little else than an animated honey-bag. In this it was analogous to another (American) species forming the genus *Myrmecocystus* of Wesmæl.

The Rev. H. S. Gorham communicated the concluding part of his "Materials for a Revision of the *Lampyridæ*."

SOME FACTS IN THE LIFE-HISTORY OF *GASTROPHYSA RAPHANI*.

BY J. A. OSBORNE, M.D.

Having hibernated in the perfect state, underground, as I believe, the beetles of *Gastrophysa raphani* reappear in spring with the first warm weather at the end of March or beginning of April. At their earliest resurrection, still sexually immature, male and female are undistinguishable, except as larger size and earlier appearance afford a presumption in favour of the latter sex. Very soon, however, begins that enlargement of the abdomen in the ♀, due to the development of the ovaries, and the formation of eggs in them, from which the genus takes its name, and which, to save circumlocution in speaking of it again, may be conveniently designated by the term *gastrophysm*. Until gastrophysm has been, to some extent at least, developed, I believe there is no fertile union of the sexes. No eggs are laid until it has reached its full extent, when all the abdominal spiracles (four on each side) are completely uncovered, the elytra are tilted upwards reaching only to the middle of the high convexity of the abdomen, and even somewhat separated at the extremities. In the recently excluded imago, on the other hand, the dorsal and ventral segments of the abdomen are connected by a broad wing-like fold of skin along either side, in the angle of which the spiracles are seen looking directly upwards.

These insects eat, both in the larva and imago states, the various common species of dock and sorrel. The eggs are laid on the under-side of the leaf, only rarely, and, as it were, accidentally, on the upper. The batch consists usually of 40—50 eggs; and I have counted as many as nineteen batches on the under-side of a single leaf, and seen others with, I am sure, many more. The same ♀ will lay again perhaps in less than 48 hours, and will continue laying for some weeks.

The ovipositor is telescopic-tubular. It consists of (at least) two pieces. The outer tube, which is exerted first between the semi-circular valves of the pygidium, and remains exerted during oviposition, is bilabiate, having an upper and lower emarginate lip, which open by lateral angles. They are strengthened, especially the upper lip, by lateral, crescentic, chitinous thickenings, of darker colour, whose sharply defined convexity is towards the extremity of the lip, shading off less definitely forwards into the substance of the yellowish transparent tube. The upper lip, like the upper valve of the pygidium, has also a whitish ciliation. Shining through this upper lip, with its crescentic clouds, may be seen two black incrassate-linear appendages,

which are also furnished with whitish cilæ at the broadened extremity, running backwards and inwards, but not meeting in an angle. This is the condition of things during the interval between the laying of two eggs. When an egg is being laid, or rather, during the latter half of the process, an inner transparent tube prolapses, bringing with it (attached to its upper lateral margins) the two black appendages just mentioned. The egg comes forward by jerks, and, after it touches the glass (I am describing the process here as watched *through* the glass cover of the pot on which the beetle was laying her eggs), there is a pause of some seconds before the complete extrusion of the egg. During this pause about half the egg is seen, and the ovipositor, viewed from the dorsal side, is hidden by the upper valve of the pygidium. Only at the final complete expulsion of the egg does the inner tube, with its appendages, come down. These appendages have motions of apposition with one another, and with the two chitinous portions of the lower lip of the outer tube, by which the end of the egg can be grasped as it were between four fingers; and it is so grasped and settled in its place, upon its side, in row with the other eggs, before anything more is done. The beetle then shifts its position a little; the ovipositor (the inner tube and its appendages having been retracted) is moved uneasily from side to side; and, after an interval of variable duration, another egg is seen coming forward by jerks to the glass (or other surface on which the eggs are being deposited). The whole process usually occupies something less than a minute. I reckon normally seven eggs in five minutes, but the rate varies much in different individuals, and is much slower towards the end of the batch. At this rate an average batch of eggs would be deposited in something over half an hour. As I have said, the eggs are laid almost universally on that surface of the leaf which is undermost at the time; and if, in confinement, a leaf be turned over while the beetle is engaged in oviposition, she will most likely walk away, and subsequently complete the operation on the other side of the leaf, it may be shortly, or it may be after an interval of several hours. One knows that it is the completion of the same batch by the sum of the two parcels agreeing with what was to be expected. The average number of eggs in a batch I found to be about 45, but the actual number varies in different females, though it is pretty constantly the same for the same individual; or rather, the *alternate* batches agree in number, a circumstance which seems to be accounted for by the alternate unburthening of themselves by two independent ovaries. Sometimes, however, both act together or in immediate succession, and a *double*

batch is the result, the number of the eggs in which is equal to the sum of two *successive* ordinary batches of the same individual; and when, as already mentioned, a beetle is interrupted in the middle of a batch, the next deposited eggs will be found to be the complement of the batch so interrupted; and if there has been any considerable interval between these two portions, there will be a corresponding interval between their times of hatching out, showing that the eggs are only fertilized when they are about to be laid, or in their passage from the ovaries to the ovipositor. The interval between two layings varies in different individuals, and sometimes in the same individual; but the average may be stated at two days or somewhat less. Twenty, thirty, or more than forty batches may be laid during the life of an individual.

As to the arrangement of the eggs upon the leaf, the first thing to be noticed is that they are laid upon their sides, and not set on end like the eggs of butterflies and those of the Colorado beetle, &c. The typical arrangement seems to be in rows, to the axis of which the long axis of the egg is inclined, at an angle somewhat under 90°. These rows are commonly broken in the middle by an angle which may have been originally determined by the furcation of the nerves of the leaf. The ends of the eggs in each succeeding row fit into the intervals between the ends of the preceding one; the last laid eggs, however, are commonly less regular in their arrangement. The whole batch has thus a somewhat fanlike or radiate appearance, and the apical or caudal angle, when it can be made out, indicates the first-laid end of the batch, and the direction in which all the tails of the future larvæ will be found lying; the first-laid end of the egg always (or nearly always*) being the caudal end.

The individual egg is of a generally elliptical contour, about $1\frac{1}{4}$ — $1\frac{1}{2}$ millimètres in length by half a mm. broad; but there is commonly a divergence from the perfectly elliptical form in two respects, impressed upon the egg, as it would seem, in the act of oviposition. During that pause of which mention has been made, after the first half of the egg has been extruded, its long axis no longer corresponds with the axis of the ovipositor, and a sort of curvature is impressed upon it, giving the egg a subreniform or sausage shape, except that its

* I have recently met with two apparent exceptions to this rule, both in the same batch, and in a portion of it where the eggs were very regularly disposed. Two eggs, viz., one in the middle of a row and one at the end of it, lay with their heads in the same direction as the tails of all the rest. Now, if these eggs, lying orderly in line with the rest, were not laid head-first in place of tail-first, the beetle, in laying them, and those immediately after them, must have executed a very nice, difficult, and apparently useless manœuvre in reversing her position some three or four times, so as to bring the eggs into the exact situations they would have occupied if she had gone on in the usual way.—J. A. O.

transverse diameter is not diminished (rather increased, perhaps) in the middle. Moreover, the grasping of the last half of the egg by the finger-like appendages (and I have seen the flexible shell strongly indented by their action) tends to force the contents towards the other extremity, and so diminish the size of the last laid, which is also the cephalic, end of the egg. These conditions are often persistent; so that I believe it may be possible to tell by them which side of the egg looked ventrally, *i. e.*, towards the surface of attachment, when laid, and which end will contain the head of the future larva.

When fresh laid, and enveloped in the glutinous matter, the eggs are perfectly smooth, shining and opaque. The colour is a clear yolk-yellow, varying a good deal in depth of tint in different individuals. I had once two females laying in the same pot whose eggs I could very easily distinguish in this way. There are often red ticks or short hyphen-like lines scattered sparsely and without regularity over the surface, like the markings on birds' eggs. I have seen a speck of this red matter on the glutinous substance extending between two eggs and not attached to either.

The eggs should be kept in a moist atmosphere during incubation, which preserves them plump and free from indentations, and greatly facilitates the hatching-out of the larvæ. I generally cut out the piece of dock with the eggs upon it, and put it into a plaster-of-paris tray covered by a pane of glass. The eggs may either be turned down in the natural position, or up towards the light; in any case, the venter of the larva develops on the side that is *uppermost*, whether that be the free surface of the egg or the surface of attachment.* This result is the same when all the light and heat falling on the eggs is made to reach them only from beneath, as I have proved by keeping them over mirrors, while the upper surface was kept cool by evaporation. It seems to be an affair of gravitation, as in the avian and batrachian egg. As the mature larva escapes from the free surface of the shell with the back of the thorax first, in those eggs which have been kept in the reverse position, and in which the venter of the larva has developed next the free surface, the young larva is obliged to make a half revolution on its long axis within the shell, before it can burst the latter and escape out of it. It *twists* itself round, bringing into view the abdominal spiracles in a spiral line and the four conspicuous warts on the dorsum, to be presently described as the "thoracic square."

* This statement is only absolute for eggs laid evenly on a horizontal surface, and kept in the same position throughout incubation. Even then, individual exceptions will be met with, as in the still rarer case of the cephalic and caudal ends lying the contrary way.—J. A. O.

The period of incubation varies, within my observation, from fourteen days to six, according to the season and the temperature. The first eggs I obtained this year were laid on the 6th of April, and hatched out on the 20th. In 1877 I had eggs in the third week in August (the warmest in that year), which hatched in six days. From that date the period of incubation gradually increased again to eight and eight and a half days. When hatching is imminent, a sudden and obvious change comes over the batch of eggs; the clear yellow colour has given place to a darker muddy discolouration, due apparently to the development of black warts and spiracles and oblique lines of hairs on the body of the larva, and to the complete detachment of the larva itself from the enclosing shell. Conspicuous at this stage, on the dorsal surface, are four relatively large, somewhat triangularly-shaped, blackish spots (warts) seated on the meso- and meta-thorax in a quadrate form, and which I call the *thoracic square*. Within and behind these are, on either side the median line, two rows of black hairs, appressed, and running obliquely backwards and inwards. In front of the thoracic square the head of the larva is noticeable by its translucency, while the slightest inclination to one side or other brings into view the eye-spots, a group of five reddish points on each side of the head. Seen laterally, and perhaps seen more distinctly at a somewhat earlier stage, because not then liable to be confounded with the antennæ and palpi, these five eye-spots are grouped, four in a diamond whose long axis points obliquely backwards and a little ventrally, whilst the fifth, somewhat further away on the ventral side, seems to lie in the continuation of a concave anteriorly, crescentic line, formed by itself and the two anterior eye-spots of the rhomboid. Assuming the head to be composed originally of annular segments, these three eye-spots would seem to lie on one, the remaining two on that immediately posterior to it.

The larva now exhibits slow but constantly repeated vermicular movements; the mandibles open and shut; the tail is generally recurved towards the dorsum. There is, as it were, a crowding forward, and an endeavour to advance in the shell by vermicular movements chiefly, and in which the legs take no part, while the anal pro-leg is in frequent requisition. The large warts of the thoracic square, armed with double hairs, are constantly sliding backward and forward along the shell. At last, an invisible slit in the longitudinal line of two of these warts on one side is effected, revealed at first only by the slow erection of a hair which has escaped through it. There is a hump or *protuberance near the head*, seeming to be formed by the *prothorax*.

though of much greater size than the prothorax alone would account for. On the posterior slope of this protuberance may be seen the thoracic square, while in front the head seems bent down and in towards the sternum. Pressure is thus brought to bear on this region of the shell. The abdomen appears attenuated posteriorly, leaving empty spaces between it and the shell, as if to make up for the increased thickness in the thoracic region. The vermicular movements continue; the anal pro-leg, at first dorsally recurved, moves forward in the shell. A process of the prothorax (which is somewhat more translucent than the other segments of the thorax) is protruded through the opening. It is wedge-shaped, the prothoracic spiracle at its posterior margin—the dorsum broadened, and the prosternum running out in the thin edge of the wedge. In front of it, the larva is nipped in, as it were, at the neck, abruptly to the head, whilst behind, the meso- and metathorax slope off towards the abdomen more gradually. After awhile the head is drawn out, vertex first. The hairs on the head point forwards, those on the other segments backwards, and so oppose a return. Head and shoulders out, it seems to rest awhile. The remainder of the body follows more easily, taking 15 or 20 minutes; but the tail of the larva remains much longer within the now somewhat rounded opening in the clear transparent shell.

The hatching having begun in one or two, others follow, and not in the order in which they were laid, after a longer or shorter interval; but it may be several hours before all are hatched out, although laid within half an hour or a little more. And this extension of the time for a whole batch is still further increased in the successive following metamorphoses. In the meantime, the first hatched larvæ will often attack and destroy the eggs still unhatched, even when not compelled thereto by want of other food. In nearly every batch there will be found a few "residual" eggs—undeveloped or arrested—2 or 3 in general, or half a dozen. Sometimes many more, especially in the batches first laid by a ♀, and towards the end of her career, when, in the latter case, there will generally be found a number of eggs, abnormal in shape and size, smaller and sometimes spherical—all of which never come to anything.

The larva feeds according to the season and the weather, from 12 to 18 days, during which time it moults twice, so dividing the period into three pretty equal stages. After it is fed up it is quiescent for 2 or 3 days before pupation. At the time of the first moult it is from 2 to 2½ mm. long; and 4 to 4½ mm. when it undergoes the second

ecdysis. The old skin splits in the usual way over the dorsum of the thorax, and the new larva comes out yellow and translucent, but soon re-acquiring the sooty black, which is its usual colour. The whole process occupies about 15 or 20 minutes, but may be much longer, especially till the tail is quite free. The mandibles are well seen in the freshly moulted larva. They have five acute reddish teeth, of which the lowermost but one is the largest, and is serrate-edged. The middle one is next in size, and the lowermost of all minute. Before pupation the larvæ creep persistently under any cover they can find, and become fastened slightly to the surface on which they are lying by their own exudations. They then become quiescent, and gradually get contracted and thickened. Just before pupation, however, the larva is somewhat elongated in shape. There is loose infolded skin at the tail end (owing, probably, to crowding forward of the pupa in the old skin). A small longitudinal split occurs over the second thoracic segment, through which the yellow colour of the pupa is very distinctly seen. This split extends forwards, forking at the head, and backwards, and in from 5 to 6 minutes the pupa is free to the tail. The anterior portion of the alimentary canal may be seen withdrawn from the mouth—a short tube with a black speck generally at the end of it. The posterior portion of the gut, however, is not cast off so soon, and 5 or 6 minutes more elapse before the pupa is quite free of the old skin. It is at first elongated and larva-like, but soon becomes broadened and shortened.

The time occupied by the whole batch in going through this metamorphosis is again longer than it took to hatch out, as the hatching itself extended over a considerably longer period than the laying of the eggs. Something again depends upon the season, but apart from this, the tendency of the whole brood to "scatter," as it were, like shot from a gun, is very obvious. If the 40 or 50 larvæ could be reared safely to this stage, they would probably take considerably over a day to pupate; and as there is a general divergence in the whole batch, there is a much greater straggling in a few individuals.

The pupa, like the eggs, is yellow; as, on the contrary, the body, in the alternating larva and imago stages, is black. This state lasts for about 7 days, and its duration varies less with time and temperature than that of any other condition through which the insect passes—say from 6 days to $7\frac{1}{2}$.

I have not noticed exactly how long the individual imago takes in its exclusion from the pupa-skin—about as long, I should say, as in

the moulting of the larva. The batch, however, is considerably longer in going through the last metamorphosis than it was in changing from larvæ to pupæ. As usual, the main body come more closely together, while there are loose stragglers both before and after. Nor do the pupæ become beetles in the same order in which they became pupæ.

The newly excluded beetle is at first pale yellow, with the exception of the parts above mentioned, but soon acquires its natural colours. The elytra are so soft at first, that impressions may be made on them which they will retain ever afterwards, as, for example, by lying on a hard smooth surface, such as that of delf.

Male and female are not to be distinguished with any certainty at first, at least by external marks alone, and it is only by the gradual development of gastrophysm in the ♀ that the sexes can be discriminated. By separating the beetles, however, in the order of their exclusion, I have found that in a batch the females are, on the whole, the first to be excluded. In one lot, for example, of 31 beetles, I placed the first 12 in the order of their exclusion in 12 boxes, correspondingly numbered; and of the remainder (disclosed the following day) six of the largest and best developed were similarly isolated. Of the first 12 all turned out females but the 10th and 11th; whilst among the latter six there was only one ♀.

These observations were made with the further object of watching the development and progress of gastrophysm in each beetle. I must recall that there are four abdominal spiracles on each side, situated on the first four abdominal segments of the imago; and as the abdomen enlarges and its dorsal segments become convex, not only the pygidium and the margins of the abdomen are uncovered, but spiracle after spiracle comes into view, and is left behind by the retreating margins of the elytra, until the fourth (reckoning from behind) is fully exposed. Then, and not before, the first eggs will be laid. The development of gastrophysm occupies from 8 or 9 to 11 or 12 days, according to the season.

With the laying of the first eggs the cycle is complete, from egg to egg again; and the whole period so occupied I found to be at the shortest 39 days—ordinarily about 6 weeks—and in colder weather extending over a considerably longer time.

The union of the sexes in those beetles which are to pass the winter, would seem to be deferred till the following spring. This is rather a prolonged business, when it does take place, and is frequently repeated when opportunity serves, but once sufficiently effected, no further re-union is necessary to the continued fertility of the ♀. On the other hand, the same ♂ seems to be capable of fertilizing many females in succession.

The virgin beetle lays eggs, as far as I know, in the same numbers, and with the same frequency, as the impregnated ♀, but these eggs are almost uniformly barren. One instance I have met with of a single egg, among several hundreds laid by a ♀ which I bred myself, and kept isolated from her exclusion, going through all the stages of development within the shell, till the time for hatching arrived, when it perished. I have given the particulars in "Nature," vol. xx, p. 430.*

Milford, Letterkenny, Ireland :
25th May, 1880.

ANARTA MELANOPA AT HOME.

BY MRS. J. FRASER.

This pretty little moth abounds on the tops of many of the Scottish mountains. In Perthshire I have found it on every Ben which I have ascended to the height of two thousand feet and upwards, during May and early June. It is not among the lovely mountain wild flowers nor yet on the heather that it is found, but when the altitude is reached where the heather grows thin and sparse and the grey lichen takes its place as a covering to the surface, there *Anarta melanopa* may be seen flying rapidly in the sunshine, or even on sunless days if the air be mild. On at least two mountain tops where *melanopa* exists in large numbers, the rocks are of a peculiar grey colour, which matches perfectly with the upper wing of the insect, and in those two localities I observed that it almost invariably alighted on the rock and was then all but invisible. Very rarely did it rest on the lichen, and although the resemblance in colour of the moth to the grey lichen was very great, it was not so perfect as the resemblance between the moth and the rocks, the latter thus affording a more perfect concealment while at rest. In other localities where the rocks are of a colour unlike the upper wing of *melanopa*, it invariably, as far as I could see, settled on the lichen-covered ground, and I did not see a single specimen alight on either rock or stone.

I have never in any locality observed *melanopa* lower down than where the lichen begins to take the place of other plants, and on a mountain side in May or early June with a hot sun and a cool fresh wind blowing over snowy peaks, it is a gladsome sight to see this pretty moth, which, with the ptarmigan, the dotterel, and the mountain hare, are almost the only living things to be seen.

18, Moray Terrace, Edinburgh :
28th June, 1880.

* The results of observations in which I am still engaged enable me simply to confirm this statement, and to prove that parthenogenesis in this species up to the hatching out of the larva does occasionally occur.—J. A. O.

perienced in collecting them. *Lepidoptera* are rather local; in some places, amongst the cistus especially, where a thin herbaceous growth occupies the intervals between the bushes, *Micros* are plentiful; and in showery weather they are easily captured while flying for shelter towards the cork trees. In fallow and cultivated parts, to which *Macros* are more partial, *Euchelia jacobææ* is found sometimes. *Hymenoptera* were well represented.

A fortnight's tramp was made from Almodovar (May 12) over the Serra de Caldeirao by Sao Bartholomeu do Messines (May 13) to Silves (May 14—17); thence (May 18) to Monchique (May 19—21), returning (May 22) by Alferce and Sao Marcos da Serra (where May 23 was spent), and (May 24) through Santa Clara a Nova to Almodovar. The neighbourhood of the Serra is thinly peopled, and at nightfall walking by moonlight towards the end of the first day's march, greater ease was experienced in falling over rocks in the mule track, than in finding a place to rest in. A dog barking on the opposite side of a deep valley eventually led to the discovery of a few cottages, each consisting of one room on the ground floor and a stable. An open door discloses supper in course of preparation over a fire of cistus wood, whose mild and somewhat fragrant smoke fills the room and oozes slowly through the red-tiled roof. After knocking at the door, an advance, accompanied with apology in dumb show for the untimely intrusion, is made towards the hearth, by whose light the phrase book is desperately ransacked for words appropriate to the occasion. At last the right place is hit upon, and "Pode Vosmecê alojar me?" is launched forth as an experiment, with significant pantomime. A reply is given: but what is the reply? That is another question altogether, about which the phrase book is silent; but events throw some light upon its nature. The hospitable peasants order their grown-up daughter to sleep in the cow house, and improvise a fourth bed upon the earthen floor of the family apartment for their unbidden guest. Supper ended, all stand up to worship in silence. Then the dictionary is admired and employed as a medium for mutual information during the smoking of "cheroots" (*anglice*, cigars of ordinary make), which *they* take to have been smuggled, and deem too precious to be consumed in one piece. When all have risen in the morning, the scene is enlivened by little pigs crowding in to be fed upon lupin-pods, and by hens and chickens in quest of maize, the pet of the family in her nightdress slapping the former when they seem too greedy. The father is with difficulty prevailed upon to accept the most ordinary remuneration, tendered as "something for the children,"

and then, as though a favour had been conferred upon *him*, walks upwards of a mile over and down a hill to point out the track which must be followed. On nearing Sao Bartholomeu do Messines the flora begins to wear a more varied aspect: in places arbutus, myrtle, and jasmine border the tortoise-haunted streams in lieu of oleander merely; and the change becomes more marked when Silves is approached, carobs and the increased luxuriance of orange, fig, and olive betokening the greater warmth and fertility of the lowlands. The call of the hoopoe and of other birds common in Alemtejo still resounds through the trees, but *Cyanopica* is a new feature in the scenery. Good sites for collecting *Lepidoptera* exist among the olive grounds and oak scrub on the hills, resorts of *Bombus* and *Ascalaphus*; streamlets fringed with *Tamarix* swarmed with *Hydroptilidæ* late in the day; but the river at Silves yielded nothing apparently but species of *Culex*. A species of *Diptera* attacks oranges; its maggots occur occasionally in the fruit at Silves, several in the same gore, and their presence is in most instances (if not always) betokened by a soft discoloured patch in the rind. Possibly this may be well known. At Monchique another change of flora is experienced, a modification of that which predominates in the cistus tracts. Near the town the sides of the hills are planted with cork woods, and with chestnut grown for rafters; lower down, and almost among the houses, orangeries, maize plots, vineyards, &c., occupy the slopes; while cereals and potatoes are planted in the uplands. Amidst the well-watered herbage many English species of plants are conspicuous, associated with peonies and rhododendrons. *Lepidoptera* were scarce, *Thais* sauntering amongst the groves, *V. cardui* in more open spaces, *V. Atalanta* high up on the hills, besides other forms. The sources of the streams at high elevations presented various peculiarities, issuing sometimes from the midst of dense thickets of rhododendrons and heath, sometimes from narrow water-cut trenches several feet in depth. Interesting forms of *Perlidæ* and *Trichoptera* can frequently be obtained at these sites by beating the heath and fern (especially *A. filix-femina*) into the net. During this excursion the distances to be traversed in a day, combined with the difficulties attendant upon the nature of the routes, precluded much collecting being done by the way.

The Portuguese government-map, edited by Cons. F. Folque (1860—5) was found insufficient for detail, but trustworthy for general bearings of localities. Consequently, in walking to Monclúque and back, the route had to be ascertained for the most part by compass

and guess. Excepting from Sao Bartholomeu do Messines to Silves, and from Silves to Monchique, the roads were mere mule-tracks, and sometimes no better than cattle or sheep paths. The country is so thinly peopled, that whenever the track happened to divide, much judgment had to be exercised in deciding which was the right branch to follow. Monchique is usually reached either by carriage from Portimao, or by mule from Casevel or Castro Verde *viâ* Ourique. From Lisbon, Portimao is accessible by occasional coasting vessels, or a steamer which sails for Faro every three weeks might be resorted to,

Cea (June 4—11), near the Estrella, is reached by diligencia from Coimbra. The inn being full, accommodation was extemporized upon the floor of the common eating room. The slopes of the mountains are in parts extensively cultivated and subjected to irrigation. Beyond the limits of cereals, potatoes are grown, up to at least 4400 feet; above this, cistus at first, and then heath is the prevailing vegetation. The neighbourhood is favourable for *Trichoptera*, but was only partially explored. It was here, at an elevation of about 1800 feet, that the larger forms of *Rhyacophila* were first met with in going northwards. Caddis worms occurred in profusion in a lake at an altitude of about 5122 feet, in company with pupæ of *Libellula* and troops of frogs; nymphs of *Siphylurus* were there also; but the season for alpine *Trichoptera* had not arrived. *Macro-Lepidoptera* were not particularly plentiful. Ponte de Morcellos (June 12—14), the half-way house between Cea and Coimbra, yielded some interesting species indigenous to the warmer parts of Beira Baixa.

Villa Real (June 22—25) is reached from Porto by rail to Pezo da Regoa, and thence by diligencia. From the first and the last mentioned towns, access can be gained by diligencia to various parts of the provinces. Braga is another focus of such routes, and from thence Salamonde and Ruivães (June 29—30), near the Gerez, were visited. Of these districts, the neighbourhood of Villa Real seems to be the best for *Trichoptera*, while the vicinage of Salamonde is perhaps more favourable for *Macro-Lepidoptera*. Heath is the prevailing growth on the hills in both districts.

Murray's Handbook (1875) is about as good a guide book for English people as any of Portugal; only it needs thorough revision. New roads of good construction, and new railways, have been and are being made in many districts, and have modified the itinerary considerably; hence, the distances by road in Murray are often greatly underrated, and some of the diligencia routes are disused. The heights of the mountains, on the other hand, are sometimes exaggerated enormously.

A calico sleeping bag for use in the country inns is a great luxury. The upper part should be made of muslin, and the bag altogether should be of a length sufficient to admit of its mouth being tied up from the interior and turned back over the face or under the head. "Notes on the Entomology of Portugal," containing no allusion to this item of economic entomology, would indeed be incomplete.

51, Park Road, Bromley, Kent:

4th August, 1880.

NOTES ON THE LEPIDOPTERA IN THE WEST OF IRELAND.

BY JAMES J. WALKER, R.N.

On the 24th February last, H. M. S. "Hawk," to which I was at the time attached, left Sheerness to join the squadron of small vessels engaged in distributing relief to the distressed inhabitants of the western coasts and islands of Ireland. The ship was employed on this duty until July 22nd, when she finally left Bantry Bay for England. A few notes on the *Lepidoptera* which came under my notice during that interval (for the most part on the coast between Galway Bay and Lough Swilly) may not be devoid of interest.

Although I found *Coleoptera* sufficiently well represented, both by species and individuals, at Galway, in March, I did not take a moth until April 6th, when I was rather surprised to meet with a good specimen of *Calocampa vetusta*, under a stone on the very summit of Croagh Patrick, near Westport, 2500 ft. above the sea-level. The next week I picked up single examples of *Trachea piniperda* and *Cidaria miata*, the latter in very fine condition, at Galway, where, on April 17th, *Pieris Napi*, *Anthocharis cardamines*, and *Satyrus Aegeria* were already on the wing. The last-mentioned insect was common (and very fine) at Queenstown, a week later, when *Cidaria suffumata*, *Eupithecia pumilata*, and (I think) *tresignata*, also put in an appearance.

At Galway, *Polyommatus Argiolus* was not rare in Merlin Park, some three miles from the town, during the first week in May, with *Thanaos Tages*, *Nola cristulalis*, *Thera variata* (not rare), *Fidonia atomaria*, *Venilia maculata*, *Ennychia octomaculalis*, and others, on the wing at the same time.

Leaving Galway on May 10th for a cruise to the northward, I had very few opportunities of collecting insects (except on the glorious sea-cliffs of Slieve League, Co. Donegal, near the summit of which I found *Saturnia carpini*, *Fidonia atomaria*, *Eupithecia nanata*, &c.),

until the ship arrived at Rathmullan, on the east shore of Lough Swilly. We remained a week (May 24th to 31st) in this very promising-looking locality, but the weather was most unfavourable for collecting, wind and rain prevailing almost the whole time. By diligently searching on perpendicular rock-faces, I managed to secure a nice series of *Larentia salicata*, and with it, *Cidaria suffumata*, *Olostera reclusa*, *Odontopera bidentata*, and others. *Eupithecia pumilata* was abundant among the heather at a considerable elevation, and in very fine condition, although it was quite worn out a month previously at Queenstown: with it *Anarta myrtilli* occurred rarely, and *Coremia ferrugaria* was numerous enough to be a nuisance. In woody places *Polyommatus Argiolus*, *Iodis lactearia*, *Eupithecia plumbeolata* and *nanata*, *Cidaria russata* (all of a dark smoky form), *Platypteryx lacer-tula*, *Cymatophora duplaris*, and others, were to be found, with *Nola cristulalis*, on the tree-trunks, and one fine and remarkably dark *Hadena adusta* under a stone. On the only fine evening during my stay, *Bombyx rubi* afforded excellent sport, the ♂ tearing madly about in an open heathy place near a wood, and looking almost scarlet in the rays of the setting sun; only one ♀ occurred, at rest.

June 2nd saw the "Hawk" at Killybegs, Co. Donegal, where I fell in with *Polyommatus Alsus*, *Thanaos Tages*, *Larentia salicata* (rare, and worn), *Eupithecia subumbrata* (also near Westport, on the 5th), *Coremia unidentaria*, and others; *Emmelesia albulata* and *Botys fus-calis* occurring in great profusion in grass-fields abounding with the yellow-rattle, *Rhinanthus crista-galli*.

A week of glorious weather in the middle of June enabled me to obtain a good number of insects at Galway, in Merlin Park, and the adjacent rough fields: though this district appears to have been so thoroughly worked years ago by Mr. Birchall, that it was very rarely that I obtained any species not previously recorded by him from thence. *Leucophasia sinapis* and *Melitæa Artemis* both occurred, but only single examples of each, and I was unable to find the headquarters of either species. *Zygæna Minos*, var. *nubigena* was fairly abundant in one rough, heathy field, where *Chelonia plantaginis* flew in some small numbers in the afternoon, but was not easy to secure—to chase it over the rough, deeply fissured surface of hard limestone, among stumps and thorny bushes, being out of the question. One little sunny open spot among the bushes, abounding in wild thyme and other attractive flowers (as well as with biting flies of most ravenous appetite) was particularly productive in small moths: here, for the first time, I had the pleasure of seeing and taking the pretty

little *Phothedes captiuncula*, flying in the hot sunshine like a *Pyrausta*, which it much resembles on the wing, being difficult to see as well as to catch. *Rhodaria sanguinalis* was much more conspicuous, and, with *Ennychia octomaculalis* and *cingulalis*, *Pyrausta ostrinalis*, *Argyrolepis Baumanniana*, and *Pterophorus tetradactylus*, was fairly well represented in point of numbers: *Phycis subornatella* and *Pterophorus hieracii* (?) being much scarcer. *Aspilates strigilaria* and *Eubolia palumbaria* occurred sparingly, and the pretty little *Cidaria fulvata*, commonly, flying over the low hazel and holly bushes, towards sunset: *Thera variata* swarmed in a plantation of Scotch firs, the moths coming down out of the trees like a brown snowstorm. The only *Corycia temerata* which I caught was a good variety, the usual black clouding of the fore-wings being almost absent. On the railway-bank, close to Galway, *Polymmatius Alsus* was abundant, and with it *Melanippe tristata* and *Euclidia glyphica* occurred rarely.

On June 22nd, the ship went to the islands in Kilkerran Bay, about twenty-five miles west of Galway, but I could find very few insects on the barren granitic rocks of Dinish and Furnish, the only islands I was able to visit. *Hepialus velleda* flew rather freely at dusk, with a few of the *var. carnus*, and fine *H. humuli*: by mothing, I got such common things as *Noctua plecta* and *c-nigrum* (one fine specimen on the 25th), *Axylia putris*, *Caradrina Morpheus*, *Eupithecia centaureata*, *Melanthia ocellata*. *Euchelia jacobææ* was common, and *Calosetia nigromaculana* of occasional occurrence, among ragwort, and *Orthotania antiquana* was not rare (but often worn) among *Stachys arvensis*, growing in patches of oats. The *Pterophori* were represented by *lithodactylus* and *bipunctidactylus*.

June 30th was a fine hot day, succeeding a three days' gale from the south-west, with continuous rain. In Merlin Park, *Satyrus Hyperanthus* was out in great profusion, with a few richly marked ♂ of *S. Semele*. *Zygæna nubigena* was represented only by three or four worn stragglers, but *Phothedes captiuncula* was more common (though far from numerous) than I had previously seen it, as well as easier to secure, several being boxed while feeding on the flowers of the wild thyme. A second brood of *Ennychia octomaculalis* was out, and in a wet place close to the railway bank, I caught a specimen of *Chilo mucronellus*: this spot had previously yielded *C. forficellus* and *Paraponyx stratiotalis*, as well as a good supply of *Hydrocampa stagnalis*.

On July 5th, the "Hawk" was again in Kilkerran Bay (the previous day, while walking near Roundstone, Co. Galway, I had

noticed *Zygæna loniceræ*, not rarely, but much worn), and this time I obtained *Emmelesia alchemillata* commonly, and in lovely condition, by beating brambles, with one fine specimen of *E. blandiata*. I worked hard for this latter insect at the time, as well as on a subsequent visit on July 13th, but without success: on the latter occasion I took a worn *Eupithecia expallidata*.

Returning to Galway on July 9th, I found *Argynnis Paphia* just coming out in Merlin Park, with the first lovely specimens of *Metrocampa margaritata*, *Orocallis elinguaris*, *Melanthia albicillata*, *Oidaria prunata* and *immanata*, and *Pyrausta purpuralis*. *Ellopiæ fasciaria* was rare, and often worn, and *Phothedes captiuncula* still lingered, though usually worn to a shadow. *Rivula sericealis* was rather troublesome in point of numbers.

At Bantry Bay, between July 16th and 21st, although the weather was very fine, and the country looked most promising—wide stretches of rocky, heathy, hill-sides, with numerous boggy places, and some nice little woods here and there—insects, with the exception of *Eubolia palumbaria* and biting flies, did not appear to be at all numerous. I picked up one fine *Plusia festuæ* at rest on a heath-stem, and *Ellopiæ fasciaria*, *Larentia cæsiata* and *salicata*, *Pseudoterpna cytisaria*, *Eupithecia nanata* (very dark), *Melanippe galiata*, and *Orambus pinetellus* occurred, with others.

Throughout my stay in Ireland, I was unable to collect later than 9 p.m., which circumstance accounts for the comparatively very few *Noctuæ* in the above record.

12, Ranelagh Road, Marine Town,
Sheerness: August 4th, 1880.

NOTES ON BRITISH TORTRICES.

BY C. G. BARRETT.

(Continued from page 38).

In former notes (E. M. M., vol. xvi, p. 243) I referred to larvæ received from Mr. Machin feeding on *Aster tripolium*, and their probable distinctness from *Catoptria æmulana*, Schl.

From these larvæ the moths have now appeared. They prove to be identical with specimens formerly taken by Mr. Howard Vaughan, and since by Mr. Machin, on the Essex coast, and referred to under the heading of *modestana*, H.-S., in an earlier volume (E. M. M., vol. x,

p. 8). I then expressed an opinion that these specimens were identical with *æmulana*, Schl., and this view was corroborated by Prof. Zeller; but in the meantime *æmulana* had been reared by Mr. Machin from *Solidago virgaurea*, and the specimens presented constant, though slight, distinctions from the coast specimens, and my friends, the captors of the latter form, repeatedly and urgently pressed its claims to be regarded as a distinct species. Specimens were again sent to Prof. Zeller, side by side with those from *Solidago*, but he still held that they formed but one variable species, and I, therefore, urged my friends to discover and rear the larva, and thus provide positive evidence on one side or the other. This has now been done, and the larvæ of the two species prove to be abundantly distinct, indeed, that of *æmulana* from *Solidago* (described *ante*, vol. xvi, p. 242) is very different from all the other *Catoptria* larvæ that I am acquainted with, in having *distinct longitudinal stripes*, while that of the *Aster* species closely resembles them, having *no stripes*.

The question then arises,—Which is the true *æmulana*? The type which I have from Prof. Zeller does not satisfactorily solve this doubt; indeed, it does not agree perfectly with either species, and it is evident that both are confounded together on the continent, since Gartner, after giving a description which agrees very well with the larva upon *Aster tripolium*, gives both *Aster* and *Solidago* as food-plants.

Heinemann, however, describes *æmulana*, Schl.: "Fore-wings brownish-grey-yellow, with numerous paler dots (flecks) on the inner margin, the basal half with white-yellow and dark brown *cross waves*, the ocellus with longitudinal black lines encompassed with shining silvery." He does not mention any food plant, but says, "in leaf-woods, rare." But this is not very material, as *Aster tripolium* is a sea-side and salt marsh plant, while *Solidago* constantly occurs in "leaf-woods" (woods of non-coniferous trees). Moreover, it is the insect reared from *Solidago* which has the "cross-waves" in the basal portion of the wing. I think, therefore, that I am right in considering the species reared from *Solidago* to be the *æmulana* of Heinemann, and, probably, of Schläger also. Also, it appears to me that though this group, rich in species, is still richer in synonyms, there is not one of these that can be reliably applied to the species reared from *Aster*, and that less confusion in the future may arise from my conferring a new name on it, than misapplying an old one. I, therefore, propose to describe this species as:—

Catoptria (Grapholitha) tripoliana, n. sp.

Alar exp., 6 to 7 lines. Fore-wings rather elongated, glossy or greasy in appearance, pale yellowish-brown (deal colour), varying either to pale drab, or to dark brown, or even to greyish-brown. Basal blotch indicated by an oblique, pointed, darker brown fascia, extending two-thirds across the wing, but often interrupted in the middle, in which case it forms a wedge-shaped streak between the principal nervures. Central fascia brownish, oblique, more or less indistinct. Ocellus clear and bright, generally containing two thick black lines, rather far apart. Above this the dark colour forms a cloud, reaching from the central fascia to the apex. Costal margin usually dotted all along with faint brown spots, which sometimes run into oblique costal streaks, but very variable in this respect. Cilia glossy, pale brown, with darker clouding, and a dark line at the base. Hind-wings whitish in the ♂, pale grey in the ♀, in both cases clouded with grey along the margin and at the apex. Head and thorax generally clear pale yellowish-brown, but varying with the colour of the fore-wing. Abdomen darker.

Differing from *æmulana* in its constantly larger size, rather longer and more pointed fore-wings, which also have a greasy appearance, while those of *æmulana* are more powdered or dappled, and in the absence of the "cross-waves" in the basal blotch, which is merely shaded inwards from the fascia. It is also exceedingly variable in shade of colour, and liable to the variation which I have before pointed out in many *Tortrices*—an almost total obliteration of the normal markings—while *æmulana* is, as far as I have yet seen, particularly constant in both colour and markings.

The larva of *tripoliana* is plump, thickest in the middle, very sluggish, often remaining contracted into a mere lump, segments wrinkled and slightly ridged, pale pinkish-yellow or salmon colour, with the dorsal line hardly darker, under parts rather more yellow, spots invisible, and apparently destitute of hairs, head black, or sometimes chestnut-brown, dorsal plate semicircular, divided, umber-brown, darker behind, anal plate small, rhomboidal, brown, feet yellowish. In flower and seed-heads of *Aster tripolium*, feeding on the seeds, and spinning the florets and pappus together.

Received, nearly full-grown, from Mr. Machin, on October 12th, 1879. When full-fed, they left the seed-heads and spun compact cocoons on the surface of rotten wood or among rubbish, and remained (doubtless, unchanged) in them for nearly nine months, assuming the pupa state in the beginning of July, and emerging from July 24th to the middle of August. Pupa bright chestnut-brown, forced out of the cocoon on emergence.

Pembroke: 16th August, 1880.

NOTES ON SPECIES OF ACULEATE HYMENOPTERA OCCURRING
IN THE HAWAIIAN ISLANDS.

BY THE REV. T. BLACKBURN, M.A., AND W. F. KIRBY.

Some months ago, the Rev. T. Blackburn forwarded a collection of Hawaiian *Hymenoptera* to the British Museum, and most of the new species were described by the late Mr. F. Smith, in Journ. Lin. Soc., xiv, pp. 675—685, and are also included in his posthumous "Descriptions of new species of *Hymenoptera* in the collection of the British Museum," published in the autumn of 1879.

Since that time, Mr. Blackburn has forwarded some additional notes, which I include, at his request, in the present paper (W. F. K.).

1. *Prosopis Blackburni*, Smith.

(Nos. 4 & 5).—If these two are the same species, the sexes differ considerably. This insect is not uncommon at flowers in sandy places on the island of Maui (T. B.).

2. *Prosopis fuscipennis*, Smith.

(No. 9).—Perhaps generically distinct from the other species. I have a single ♀ not noticeably differing from the ♂, except in the number of joints of antennæ, and in the greater width of the abdomen (T. B.).

3. *Prosopis facilis*, Smith.

(Nos. 6 & 7).—Fairly common in various localities in the mountains of Oahu (not Maui), generally flying about the face of bare precipices (T. B.).

4. *Prosopis hilaris*, Smith.

(No. 8).—Occurs in company with *P. Blackburni*. I have not seen any specimens which I could regard as the ♀ of this insect (T. B.).

5. *Prosopis volatilis*, Smith.

(No. 25).—Occurs rarely in Oahu (not Kauai), usually in company with *P. facilis* (T. B.).

6. *Prosopis flavifrons*, sp. n.

(No. 24).—Length, 2½ lines. Black, wings hyaline and iridescent, clouded towards the extremity. Face below the antennæ bright yellow, antennæ reddish beneath towards the extremity. Head and thorax dull black, closely punctured. Abdomen shining black, hardly punctured; extremities of the tarsi reddish. This species is ticketed *carbonaria*, Smith; but I cannot find that it has been described; and the specific name has already been used in the genus (W. F. K.).

Taken at flowers on Kauai, very sparingly (T. B.).

7. *Megachile diligens*, Smith.

(No. 23).

8. *Xylocopa æncipennis*, De Geer.

(Nos. 21 & 22).—A common South American insect (W. F. K.). Common near Honolulu, and I think elsewhere. Does much damage by boring holes in trees, timber, &c. (T. B.).

9. *Apis mellifica*, Linné.

(No. 65).—Island of Oahu (T. B.).

10. *Pelopæus flavipes*, Fabr.

(Nos. 16 & 37).—One of the commonest *Hymenoptera* all over the Archipelago. I bred it, as well as *Pison hospes*, and also a species of *Odynerus*, from a single mass of mud cells found adhering to the eaves of an old shed, on Kauai (T. B.).

11. *Odynerus localis*, Smith.

(Nos. 30 & 31).—Common on Kauai. Apparently same habits as *O. maurus*, and may possibly be a variety (T. B.).

12. *Odynerus extraneus*, sp. n.

(No. 32).—♀. Length, $6\frac{1}{2}$ lines. Closely resembles the last species, with which it was confounded by Mr. Smith. Black; head, thorax, and basal segment of abdomen closely and coarsely punctured; but the remainder of the abdomen is black and shining, and very finely punctured. The basal segment is more constricted behind than in *localis*. The first and second segments are bordered behind with pale yellow as in *localis* (not with white, as Smith erroneously states in his description of that species), but the punctures on the second band, which are very distinct in *localis*, are scarcely visible in *extraneus* (W. F. K.).

From Kauai; I do not possess the ♂ (T. B.).

13. *Odynerus maurus*, Smith.

(Nos. 11 & 12).

14. *Odynerus rubritinctus*, Smith.

(No. 15).—Taken in company with *Prosopis Blackburni* in Maui. I possess three specimens, all males. In *O. Blackburni* the wings are light fuscous, with a kind of fuscous iridescence, but with no trace of violet; in *rubritinctus* they have a brilliant violet iridescence. The head, thorax and abdomen are coloured identically in all the specimens of *Blackburni* and *rubritinctus* respectively; the punctuation of *Blackburni* is coarser and more confused than in the other species, especially on the first segment of the abdomen. The males of *rubritinctus* have two long styles projecting from the apex of the abdomen

(as in *O. incongruus*, Smith), which are apparently wanting in the males of *Blackburni*, but which may possibly depend on the attitude of the body at the moment of death (T. B.).

15. *Odynerus Blackburni*, sp. n.

Odynerus rubritinctus, ♂, Smith.

(No. 33).—I have two males and one female of this species. From Kauai. Allied to the last, and of similar habits (T. B.). In his remarks on the last species, Mr. Blackburn points out the differences between it and the present. In Mr. Smith's description (New Spec. Hym., p. 135, last line) we should evidently read for—"two (spots) beneath wings, frequently united,"—"two (spots) beneath wings, *almost* united" (W. F. K.).

16. *Odynerus montanus*, Smith.

(Nos. 28 & 41).—Occurs high up on the mountains of Oahu (T. B.).

17. *Odynerus congruus*, Smith.

(Nos. 13 & 14).—Found in company with *Prosopis Blackburni*. The wings exhibit a brilliant violet iridescence in certain lights, not mentioned in the description (T. B.).

18. *Odynerus dubiosus*, Smith.

(No. 35).—Common near Honolulu and elsewhere on Oahu (T. B.).

19. *Odynerus agilis*, Smith.

(No. 34).—From Maui. Frequents flowers, but seems to be rare, as I hunted a long time for a series, and only obtained two specimens (T. B.).

20. *Crabro affinis*, Smith.

(No. 36).

21. *Crabro mandibularis*, Smith.

(No. 3).

22. *Crabro denticornis*, Smith.

(Nos. 1 & 2) —Nos. 1—3 taken at flowers on Maui, February, 1878. I believe these to be all one species, as also a single female taken in company with them, having the abdomen much marked with yellow (T. B.).

23. *Crabro unicolor*, Smith.

(No. 29).—Very rare; but occurs on Oahu and Maui, and probably all over the islands (T. B.).

24. *Crabro stygius*, sp. n.

(No. 10).—Occurs in Oahu. I cannot consider this identified with No. 29; the clear wings separate it at once. The single ♀ I possess has a yellow collar, wanting in same sex of 29, which has the labrum covered with dense silvery pubescence (T. B.).

♂. Length, 4 lines. Resembles *C. unicolor*. Black; abdomen shining; face deeply channelled, eyes much wider apart than in *unicolor*; labrum silvery; top of head more shining than the thorax, but less so than the abdomen; stemmata in a triangle on the vertex. Thorax finely punctured; mesothorax with no distinct longitudinal depression, which exists in *O. unicolor*, but with a transverse ridge before, and two behind, and the metathorax slightly channelled, as in that species. Wings hyaline, but slightly clouded. Abdomen smooth and shining, clothed towards the apex with greyish pubescence (W. F. K.).

25. *Pison iridipennis*, Smith.

(No. 40).

26. *Pison hospes*, Smith.

(Nos. 38 & 39).—In writing to Mr. Smith, I did not intend to imply that *Pison* is parasitic, but merely remarked on the circumstance that species of three genera combined in the construction of a single mass of cells (T. B.).

27. *Polistes aurifer*, Sauss.

(Nos. 26 & 27).—Plentiful all over the islands, and stings very severely. Makes nests in various places, usually preferring (as far as my experience goes) a hollow trunk of a tree (T. B.). A well-known Californian species (W. F. K.).

28. *Camponotus sexguttatus*, Mayr.

(Nos. 18, 42, 43).—Common in Honolulu; ♀ common at light in Oahu (T. B.).

29. *Prenolepis clandestina*, Mayr.

(Nos. 19 & 20).—I have found a small nest under a stone near Honolulu, from which I obtained the male, worker, and a single female (T. B.).

30. *Ponera contracta*, Latr.

(Nos. 50 & 51).

31. *Leptogenys insularis*, Smith.

(No. 52).—Honolulu, and the surrounding plains (T. B.).

32. *Tetramorium guineense*, Fabr.

(No. 49).

33. *Pheidole pusilla*, Heer.

(Nos. 44, 45, 46, & 48).—One of the commonest ants in Oahu, and probably elsewhere (T. B.). The house-ant of Madeira; and occasionally met with in England (W. F. K.).

34. *Solenopsis geminata*, Fabr.

(Nos. 47 & 53).—Common near Honolulu; also met with in Oahu (T. B.).

35. *Evania lævigata*, Latr.

(No. 17).—Generally common in Honolulu (T. B.). Common throughout the warmer parts of the world (W. F. K.).

The collection also contained about a dozen specimens of *Chalcidæ*, &c., which stand over for future examination. Mr. Blackburn informs me, in answer to an enquiry, that he has not yet met with any *Tenthredinidæ* (W. F. K.).

July, 1880.

Note on Eupteryx stachydearum, Hardy.—On the 25th inst. I found this species abundant on tansy (*Tanacetum vulgare*) in the garden, both sexes in different stages of maturity, and there was therefore no doubt that they had fed on this plant. This is worth recording, because the species has hitherto been noted as having been found on plants of the Order *Lamiaceæ*, of which none were near the place; whereas the tansy belongs to the *Compositæ*.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: July 30th, 1880.

Two new European Homoptera.—[In the "Entomologische Nachrichten" of 1st March last, are the following descriptions of two very interesting species, which I transcribe for the benefit of those who may be inclined to look for the insects in Britain, where there is surely good reason to believe they may be found; the *Aleurodes*, especially, in the north.—J. W. D.]

ALEURODES VACCINII, Künow. Antennæ, legs, and abdomen yellow. Head, pronotum, and thorax brownish, each segment of the abdomen also with a transverse brownish band; but in newly developed examples the entire body is unicolorous yellow.

Antennæ short, the second joint the longest, as long as the four following together. Eyes large, only one on each side (*A. proletella* has two on each side), constricted in the middle. Wings pure white, apex broadly rounded, the broadest part shortly before the end, and all with one nerve, which reaches almost to the end. In the upper wings the nerve arises near the outer margin, and beyond the middle of the wing up to the end lies at a very obtuse angle; in the under-wings the nerve goes in an almost straight line through the middle. In the ♂ the wings are narrower, and the abdomen, which is forcipate at the end, is more slender.

Length, ♂, 1 mill., ♀, 1½ mm.

Pupa oval, very flat, 1—1½ mm. long, ⅔ mm. broad, yellowish, with some brownish dots and marks. Thorax and abdomen sharply raised on the upper side, the latter, on the middle line and on the sides, having small prominences, the rest of the broad and flat margin crenate.

This species lives on *Vaccinium uliginosum*, and has hitherto been found by me only on one spot in the "Caporner Haide," near Königsberg. The pupæ, attached to the under-side of the leaves, fall with them to the earth and hibernate; the perfect insects are developed at the middle of June in the following year.

COCCUS COMARI, KÜNOW. ♀, oval, a little longer than broad, beneath flat, above hemispherical; colour clear brown; the insect surrounded by a singular wreath-like white secretion.

Head free, projecting downwards. Antennæ and legs very short. Antennæ 9-jointed, the end joint the longest, the first two thicker than the rest, but of equal length with the third. The segments of the body, both on the upper and under-side, are perceptibly separable; the apex with two small points.

Length, 2½—3 mm.; ♂ unknown.

This species, which is found on *Comarum palustre*, sucking near the root, is distinguished in many respects from other species of the genus, so much so that a new genus might be founded on it. All the species of *Coccus* known to me move about up to the time of their maturity, then fasten themselves, and, as they are slowly perfected, lay their eggs in a white enveloping secretion. *C. comari*, on the contrary, sucks itself (saugt sich) fast precociously (probably, soon after coition), and never after leaves the place. (Hence the retardation of development in the legs.) The young ones are developed in the body of the still-living mother, and remove thence at the end of June. Locality, Dammhof, near Königsberg.—KÜNOW, Königsberg.

On the mode of respiration in the larvæ of the genus Euphæa (Calopterygina).—

On each side of segments 1—8 of the abdomen is a conical branchial appendage with unravelled edges; three strong, equal, cylindrical caudal branchial appendages; the rectal branchiæ formed of three simple columns.

The existence of lateral branchial abdominal appendages is known in the genus *Sialis*, but is altogether unique in the *Odonata*. Respiration in the larva of *Euphæa* is thus possible in four different manners. (1) by stigmata, two on the thorax and eight on the abdomen; (2) by lateral branchial appendages well provided with tracheæ; (3) by caudal branchial appendages equally well provided with tracheæ; (4) by rectal branchiæ formed of three columns in the mucous system of the rectum, well provided with tracheæ. No doubt the four kinds of respiration do not act simultaneously, and the stigmata of the abdomen probably never, as they only receive a simple tracheal branch, but the stigmata of the prothorax are provided internally with numerous well-developed tracheæ, and perhaps serve for the expulsion of used air.—H. A. HAGEN (translated and abridged from the Comptes Rendus of the Belgian Entomological Society, Meeting of the 1st May, 1880).

[This is a most important physiological discovery, and shows how little is yet known of the structure of the larvæ of Dragon-flies. The beautiful genus *Euphæa* inhabits tropical Asia and the islands of the Eastern Archipelago.—R. McL.]

Æcetis notata in Yorkshire.—You will be interested to hear that *Æcetis notata* is common by the River Wharfe, at Tadcaster, Yorkshire. It is associated with *Æ. testacea*, which is also abundant.—FRANCIS G. BINNIE, 439, St. Vincent Street, Glasgow: 28th June, 1880.

[*Æ. notata*, a pretty long-horned Trichopterous insect, was known as British only by the example taken by me at Weybridge in 1873, recorded in Vol. xiv, p. 18, of this Magazine.—R. McL.]

[P.S.—On the 17th inst. I found another example near Weybridge, on the north bank of the Thames, nearly opposite the mouth of the Wey.—R. McL.: 28th July, 1880.]

Marsh Lepidoptera in Pembrokeshire.—In this moist climate (of Pembrokeshire) it would seem reasonable to expect that, along with marsh plants, marsh insects would be widely distributed over the country, and this certainly is the case with some few species, but there are degrees of dampness even here, and I have lately been much interested in working a piece of peculiarly wet marsh, thickly overgrown with *Iris pseudacorus* (locally called "Liverocks"), *Senecio aquaticus*, *Myosotis palustris*, *Ranunculus flammula*, *Sparganium*, *Mentha*, *Epilobium*, &c. Here I found what I have looked for in vain for many years—*Bactra furfurana*—in plenty and with considerable variation in markings, flying late in the afternoon and until dusk among the lowest herbage, and notably among a small slender species of rush which must surely be its food-plant. Here also was *Platyptilia isodactylus*, not so plentiful but by no means scarce, flying before dusk among *Senecio aquaticus*, in the stem of which its larva feeds, and among which it conceals itself in the day time, and here too are occasionally to be found the very pretty little *Opostega crepusculella*, with *Laverna propinquilla* and *lacteella*, which, with a dubious *Coleophora*, complete as far as I know the list of interesting Micros, but *Phibalopteryx lignata* occasionally flits by, and the flowers attract *Plusia festuæ* and other *Noctuæ*. On one particularly favourable evening I met with three *Camptogramma fluviata* flying over the flags. All were worn and all males, but the hint may lead to future more satisfactory results.—CHARLES G. BARRETT, Pembroke: 13th July, 1880.

[P.S.—*Platyptilia isodactylus* is again out, but smaller of course, from its rapid feeding up in hot weather. If it were desirable, or I could spare the time, it would be easy to take hundreds. Along with it is *Scopula ferrugalis* in plenty.—C. G. B.: 17th August, 1880.]

Food of Scopula lutealis.—I have recently been breeding this species, from larvae collected here at the end of May, very freely from the lower leaves of bramble bushes, and also from wild strawberry, *Plantago lanceolata*, *Ranunculus*, and several other low plants. The larva described in this Magazine some time ago was found on dock; and Dr. F. B. White found it on thistle, so it is evidently quite as general a feeder as are *prunalis* and *olivalis*.—GEO. T. PORRITT, Highroyd House, Huddersfield: August 5th, 1880.

Natural History of Crambus culmellus.—Although this is a very common

species, yet its history has, I believe, never been investigated, or any description of the larva published, a desideratum I have herein attempted to supply from the opportunity afforded me by Mr. J. Gardner, of Hartlepool, who kindly sent me first a larva, in 1878, and in 1879 a batch of eggs on 22nd of August; these began to hatch on the 28th, when the larvæ were transferred to a large pot planted with *Festuca duriuscula*, and having a margin of moss inside.

On the 4th of October I observed several of their little tubular galleries, open at top, as they were spun in an upright position amongst the grass, with a few withered grass particles adhering; and by the 16th, many more could be seen, more or less connected with each other and the grass by a number of fine silk threads.

The grass was vigorous enough to withstand their early attacks, and flourished well during the ensuing winter while the larvæ were quiescent, until a warm and sunny day (the 6th of March, 1880) waked them from their torpor, when they became very busy amongst both grass and moss, in extending the old residences and constructing others, uniting the moss-covered galleries to the grass blades near, with a great number of fine threads, and in the same way they secured the moss to the side of the pot.

By degrees, the combined attack began to check the growth of the grass, which presented a melancholy spectacle as June approached, when a fresh pot was provided, barely in time, as I found the greater number of larvæ had escaped, though a couple had been picked up while deserting their old quarters, just in time to warn me of their exodus; but enough for my purpose were put in the fresh grass to produce six examples of the moth, which appeared from 19th of July to August 1st.

The egg in shape is elliptical, having an elongate depression on part of its surface, and is very closely ribbed and finely reticulated; when first laid it is of a whitish straw tint, changing in two days to flesh colour, again onwards to salmon colour, and then to deep pink, when it begins to hatch. The young larva at first is of a pinkish-salmon colour with darkish brown glossy head and plate, the body without gloss, and a pale brown anal plate. By the middle of October the larva is just a little over one-eighth of an inch long and proportionally stout, its form cylindrical and slightly tapered only at the hinder segment, having all the segmental divisions well cut, the head is of an opalescent or whitish flesh colour with conspicuous black ocelli, the second segment is of similar pale colour but having an internal leaden-grey blotch showing through the surface, the rest of the body pinkish-brown, with the anal flap pale as the head, the horny tubercular spots close together and concolorous: its gallery or tube a quarter of an inch long, composed of silk, covered with frass having the appearance of finely gnawed grass.

After hibernation the new gallery is formed between a few blades of grass, about the distance of an inch and a half above the ground, and is covered with fine particles of moss and of withered remnants of grass blades, or with frass only; early in March its occupant is more than three-sixteenths of an inch long, of an uniform brown colour, the spots only noticeable by their gloss.

Towards the end of April the larva has grown to the length of three-eighths of an inch, moderately stout in proportion, though gently tapering from the thoracic segments to the thirteenth, its colour much paler, without any difference in that of the head, plates, spots, or the skin of the body, except that the latter is dull and all the former shining.

During June the larva attains full growth of half an inch in length, or a trifle more, the skin of the body is still a light flesh colour, but the head, plates, and spots show more distinctly from it of a light warm cinnamon glossy brown, the spots not quite so large in proportion as with many of the genus, the parts of the mouth are outlined with darker brown, and each lobe on the crown of the head is margined by a short blackish-brown streak, and has besides a few other spots and streaks above; the plate on the second segment bears a few minute black-brown dots and a larger pair on the hind margin; each tubercular spot bears two dots of darkish brown, one small, the other larger, furnished with a fine hair, the minute spiracles are round and black. It travels forwards or backwards equally well, and from the middle of June converts its tubular residence into a cocoon of oval shape from three-eighths to half an inch longest diameter, smoothly lined with pale grey silk and externally covered with frass or particles of moss, or with both.

The pupa is three-eighths of an inch long, of the usual contour but rather plump, the head and thorax moderately produced, the form tapering very slightly towards the widest part of the body at the ends of the long wing-covers, from thence the abdomen tapers a little more towards the rounded-off tip ending with a rather prominent boss; in colour it is a light warm shining brown, the lower part of the wing-covers paler brownish-yellow, the terminal boss dark brown.—WILLIAM BUCKLER, Emsworth: August 12th, 1880.

Batrachedra præangusta.—In my letter to Mr. Stainton which he has published in the Magazine for this month, I stated that having found a larva in the lining of a gold-finch's nest, it was not until I saw what the nest was lined with that I recognised the species to which that larva belonged. Mr. Stainton seems to me to go somewhat out of his way in suggesting that the reverse of this mental process was what actually occurred. He writes, "No doubt the larva itself helped to explain to Lord Walsingham of what materials the lining of the nest was really composed, for the larva of *Batrachedra præangusta* is so remarkably conspicuous that any one who has once seen it can hardly fail to recognise it wherever "met with."

Had this been the case I should not have expressed myself in exactly the opposite sense.

I gave to Mr. Stainton two or three years ago the only two preserved specimens of this larva which were in my collection, together with the information which seemed to be of some interest to him, that they were found living in the down of willow catkins.

The curious position in which this larva has now been found, although confirming my previous observation as to its habits, affords perhaps a sufficient excuse for my having failed to recognise it, until by chance I saw that the gold-finch's nest was not lined with the usual thistle-down, but with that of willow catkins.—WALSINGHAM, Eaton House: July 16th, 1880.

Capture of Dyachirius angustatus, Abr., at Hayling Island.—I was at Hayling Island for two days about the end of last June, and captured about half-a-dozen of the above-named species on the Sandhills, to the West of South Hayling. I did not

recognise the species when I caught it, or I might doubtless have secured more. I cannot find it recorded from this locality before, although I hear that Mr. Moncreaff has also taken it.—EDWARD SAUNDERS, Holmesdale, Upper Tooting: *August 11th*, 1880.

On the phosphorescence of the Glow-worm.—In reading Dr. Sharp's note on the European Firefly in the August number, p. 69, on the interruption of light, as described by MM. Perroud and Arias, in the above species, it occurred to me that I have observed a similar interruption in the light of our common Glow-worm. I had a fine female sent me for identification some time ago, and I turned her out on my grass plot, she concealed herself during the day and at night came out and exhibited her light; I have stood over her with a lamp to see if the strong light which it gave would have any effect upon her, but so far as I could see it had none. While watching her I observed that she was turned half round, that is, the posterior segments were turned half round so as to bring the inferior surface uppermost, and thus exhibit the light, or rather lights, for the phosphoric light emanates from two of the abdominal rings leaving a distinct line between the two light-giving spots.

The insect will remain in the position above described for two or three or more minutes, and then turn herself, or rather the abdominal half, round on the other side so as to throw the light in another direction. When she has remained in this position without attracting a mate she will again reverse the light, and try again in another direction, by this means the observer sees an intermittent light; I watched this insect for several nights and observed that she proceeded in the same manner on each night. This will account for the disappearance of the light at certain times, and its re-appearance.—EDWARD PARFITT, Exeter: *July 31st*, 1880.

Notes on the intermittent light of Luciola lusitanica.—In returning by the high road from Sacavem to Lisbon in the evening of April 24th, the sight of a few fireflies upon the wing recalled to mind a discussion at the Meeting of the London Entomological Society in February last, concerning the manner of their giving light. I therefore stopped to ascertain by careful observation some particulars about it, which were noted down the same night. It will be seen that they do not entirely agree with M. Mulsant's statement of the means by which the light is extinguished, to which Dr. Sharp has alluded in the present volume of the E. M. M., at p. 69. My notes do not record the colour of the light, but, judging from recollection, I believe that when viewed at a moderate distance it is very spark-like in appearance; whereas, if examined with a lens, the effulgence may be likened to that of the moon seen through a telescope.

The duration of each gleam of the light is from about $\frac{1}{4}$ to about $\frac{1}{3}$ of a second; and usually there are on an average 36 emissions a minute. The light throbs in the luminous patches simultaneously, and is extinguished as a rule completely during the intervals of the flashes; but under certain circumstances it can be reduced to an almost imperceptible phosphorescence without being quite put out. The hinder patch can be darkened independently of the other, from which it is separated by a transverse non-luminous band, and is slightly emarginate in the middle behind. In sites exposed to the breeze the insects remain settled in places where shelter is afforded them (*e. g.*, in the lee of stones in the roadside heaps, or at the entrance of

chinks in "dry walls"), while within a stone's throw of the same localities their neighbours in nooks protected from the wind are flying freely. The flashes of light are maintained at the ordinary rate of intermission after the insect has alighted, and when it is caught in a hat; but if it is held between the finger and thumb their frequency is greatly increased. Within the cyanide bottle the beetle at first continues to flash; but within a few seconds after being placed there, the light gleams steadily without interruption, gradually dying away *pari passu* with the insect.

At the end of April fire-flies were only just beginning to appear at Cintra, and therefore were few in number. At no time did I see them anywhere in throngs; consequently my notes exclusively refer to the behaviour of individual specimens in solitude.—A. E. EATON, 51, Park Road, Bromley, Kent: *August 7th*, 1880.

Review.

ILLUSTRATIONS OF TYPICAL SPECIMENS OF LEPIDOPTERA HETEROCERA IN THE COLLECTION OF THE BRITISH MUSEUM. Part IV. *North American Tortricidæ*. By LORD WALSHINGHAM. London: printed by order of the Trustees, 1879. 4to, pp. 84, and 17 Plates.

This work is without doubt one of the most valuable contributions to our knowledge of the North American *Tortricidæ* that has hitherto appeared. His lordship has not only described a large number of new species from our Pacific Coast, but has also re-described the North American species of the *Tortricidæ* published by Francis Walker, giving colored figures of all.

Of the work of Mr. Walker I have no need to speak, since his entomological writings have been most fully discussed, not only by American and German but also by English entomologists themselves. Many Micro-Lepidopterists have quite disregarded his species because his descriptions are so very faulty, but Lord Walsingham comes in with this most timely contribution and makes us acquainted with Walker's species of the *Tortricidæ* from North America, and it is sincerely hoped that he will continue the work so well and auspiciously commenced, until he has re-published all of Walker's species of the *Micro-Lepidoptera* from whatever country.

To one who has examined Walker's types, it will be a matter of surprise that so great a degree of accuracy has been obtained, for many of the typical specimens in the British Museum, described by Walker, are so badly denuded that they ought never to have been described at all. The imperfection and unnaturalness of some of the illustrations are doubtless to be accounted for in this way.

The system of classification laid down by Heinemann has been adopted with some modifications; but with all the imperfections of that system, it is, without doubt, in the direction of a more complete and natural classification for the *Tortricidæ* than has been presented by others.

There can be no doubt that a step has been taken in the right direction, in raising the sub-genera of Heinemann to generic position, which has already been done in part by Wocke and others.

On the orthography of certain names there will, no doubt, be a difference of opinion. Many agree with Prof. Zeller in changing the spelling of a word from that given by the original author to one more consistent with the derivation, and Lord Walsingham, in a letter just received by me, says, "I shall be grateful to you

in any review of my work to correct *Cochylis* to *Conchylis* with my entire concurrence." I have read with care all that has come under my notice published on this question of orthography, and I can reach no other conclusion than that it is better to make such corrections as the above, and for the same reason *Loxotania*, Steph., becomes *Loxotania*, Steph.

For the Californian species *cuneanum*, the genus *Hendecastema* is established, but this species is identical in structure with *humerosana* which Clemens published in 1860, and for which he established the genus *Amorbia* which must take precedence over *Hendecastema*. I am very sure his lordship did not possess an example of *humerosana* at the time he published this work, else he would have noticed their generic relation and placed his *cuneanum* in the genus *Amorbia* of Clemens.

I cannot convince myself that *lutosana*, Clem., is identical with *incertana*, Clem., or with the European *politana*, which is not uncommon in this country. Specimens identified by Prof. Zeller as *politana*, Haw., have been raised here from *Pinus strobus*. I think the identity of these species is still an open question.

The species *pulcherrimana*, Wlsm., and *demissana*, Wlsm., belong to the genus *Dichelia*, while *xanthoides*, Wlk. belongs to *Enectra*.

Conchylis gratana, Wlk., is regarded as equivalent to "*Crossia? reticulatana*, Clem., var. *sulfureana*," but *reticulatana*, Clem., is a true *Cenopsis*, while *sulfureana*, Clem., is quite distinct, belonging to the genus *Dichelia*. According to my notes on Walker's types *gratana*, Wlk., is identical with *sulfureana*, Clem.

Sericoris fœdana, Clem., is given as a synonym of *Penthina hebesana*, Wlk. I must hold myself responsible for this error, for I am very sure I told his lordship that such was the case, and I had very good reason at the time for thinking so, but I now have the type of *fœdana* before me, and it proves to be distinct from *hebesana*, Wlk., but identical with *Sericoris concinnana*, Clem., and is a true *Exartema* and must be known hereafter as *Exartema concinnanum*, Clem.

Exartema griseoalbum, Wlsm., is a true *Penthina*, as shown by the males in my collection. The type was a female, hence it was not possible to be sure of its location.

The British Museum Authorities are to be congratulated upon the publication of a work so reliable and valuable to workers on this family of insects.—C. H. FERNALD, State College, Orono, Maine, U.S.A.

ENTOMOLOGICAL SOCIETY OF LONDON.—August 4th, 1880. J. W. DUNNING, Esq., M.A., F.L.S., Vice-President, in the Chair.

Sir Sidney Saunders forwarded for exhibition four living specimens of *Prosopis rubicola*, all stylized females, recently bred from larvæ extracted from briars received from Epirus, and contributed notes thereon.

Miss E. A. Ormerod exhibited a soft gall-like formation found on *Rhododendron ferrugineum*, but believed to be of fungoid growth.

Mr. Billups exhibited a specimen of *Heptaulacus villosus* from Box Hill.

Mr. H. J. Elwes communicated a paper "On the genus *Colias*."

Mr. W. L. Distant read a paper entitled "Notes on exotic Rhynchota, with descriptions of new Species."

DESCRIPTIONS OF FIVE SPECIES OF ACULEATE *HYMENOPTERA*
UNRECORDED AS BRITISH.

BY EDWARD SAUNDERS, F.L.S.

In the August number of this magazine I mentioned that I had captured at Chobham three species of *Pompilidæ* new to our list, and I deferred describing them fully until I could have an opportunity of examining them more carefully. I now offer the descriptions of these, and also that of a fourth species, of which I took a ♂, two years ago, at Chobham, and two ♀ this year.

During my stay at Chobham, I also caught two ♂ of a species of *Andrena*,* which I did not recognise, flying about the heather: these prove to be ♂ of *lucens*, Imhoff, a very distinct species, and also an addition to our fauna. I find in my collection another specimen of the same species, without note of locality, given to me by the Rev. H. S. Gorham. A description of this species follows those of the *Pompilidæ*.

1. *Pompilus minutulus*, Dahlbm., Dispos., 1842, p. 10.

= *neglectus*, Dahlbm.?

= *cellularis*, Thoms.

Black, the two basal segments of the abdomen, and the base of the 3rd red; the apex of the 2nd segment in the ♂ sometimes more or less fuscous.

Face, below the antennæ, sides of the thorax, the metathorax, and coxæ, covered with silvery pubescence; prothorax sharply emarginate posteriorly, wings with a broad, fuscous, apical band; 3rd submarginal cell triangular. ♂ with the posterior tibiæ sinuate on the side towards the body, and incrassated at the apex. ♀ with the anterior tarsi simply spinose, not pectinated as in most of the species. Length, 8—9 mill.



Posterior
tibia of
P. minu-
tulus ♂.

This species exactly resembles *gibbus* in general appearance, but the shape of the posterior tibiæ of the ♂ and of the anterior tarsi of the ♀ readily distinguish it.

Thomson calls this species *cellularis*, Dahlb., and refers Dahlbom's *neglectus* to *spissus*; he may be right as to *neglectus*, of which Dahlbom says, "cellula cubitalis 3ia late trapezina," a character belonging to *spissus*, and not to this species, but I cannot think that he is right in referring our species to *cellularis*, Dahlb., of which the author says: "cellula cubitalis 3ia minuta triangularis petiolata, corpus parvum ♂ valvula analis et segmenta ventralia ut in ♂ pectinipede, at valvula major et apice barbatula."

Wesmael, who, like Thomson, describes the present species most

* Since writing the above, I have been again to Chobham, and succeeded in obtaining another ♂, and also a ♀.

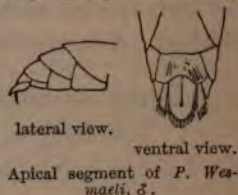
accurately, adopts the name of *neglectus* for it, and says that he has seen specimens so named by Dahlbom himself in which the 3rd sub-marginal cell was triangular, and, therefore, assumes that Dahlbom made an error in his description.

Both Wesmael and Thomson, however, agree that the ♂ to which Dahlbom gave the name of *minutulus* is the ♂ of the present species; and I have, therefore, adopted this name, as it clearly has the priority, having been used by him in his "Dispositio," in 1842; whereas *cellularis* and *neglectus* were only described in 1845.

2. *Pompilus Wesmaeli*, Thoms., Op. Ent., p. 221. Hym. Scand., iii, p. 149.

Same coloration, &c., as *gibbus* and its allies, but easily distinguished, as the ♂ has the apical ventral plate slightly carinated, and armed near the apex with a long pendant spine; the ♀ is more difficult to recognise, but may be known by the somewhat carinated, compressed apical segment beneath.

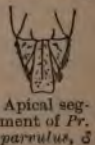
I called this species in my notes (*ante*, p. 68) *abnormis*, Dahlb., but I see now that it clearly belongs to *Wesmaeli*. *Abnormis* also has the pendant spine in the ♂, but has the base of the ventral plate flat, and an oval fovea before the spine.



3. *Priocnemis parvulus*, Dahlb., Hym. Eur., i, p. 460.

Black, with the two basal segments of the abdomen red, the basal segment in the ♂ often with a longitudinal black stripe at its base.

Head and thorax finely punctured, covered with a fine sericeous, and in some lights silvery, pubescence, the pubescence on the coxæ and mesopleuræ denser and more distinctly silvery, wings slightly dusky with a darker stripe through the 2nd and 3rd sub-marginal cells, and a darker patch in the 3rd discoidal cell; beyond the apex of the 3rd sub-marginal is an irregularly-shaped clearer spot, sometimes wanting; the apex of the wing widely dusky. Abdomen shining, 3rd and following segments covered with a fine sericeous-grey pubescence; 5th segment in the ♀ with a few longer hairs, and 6th rather thickly covered with them. Beneath with a few scattered hairs. Apical segment carinated at the apex; ♂ with the anal ventral valve hairy and narrow, slightly widened at the apex and truncate (see figure); posterior calcaria not two-thirds as long as the basal joint of the tarsi.



Length, 6—8 mill.

Very distinct from any of the others of the *exaltatus* group, in the shape of the ventral anal plate of the ♂, and the absence of the clear round spot in the wings of the ♀.

4. *Priocnemis pusillus*, Schiödte, Kroy. Tidsch., 4 heft, p. 327.

Like *exaltatus* in having the clear round spot at the apex of the wings in the ♀, but distinguishable at once by the shape of the anal ventral valve of the ♂, which is rounded at the sides, and deeply emarginate at the apex, and has the margins ciliated with long hairs. The ♀ may be known by its stouter antennæ, its less sharply emarginate prothorax posteriorly, its shorter wings, which have the externo-medial nervure straight across the base of the first discoidal cell, its shorter, more convex, metathorax, and its carinated apical segment beneath.



Apical segment of *Pr. pusillus*, ♂

Length, 7—8 mill.

5. *Andrena lucens*, Imhoff, Mitth. schweiz. ent. Ges., ii, p. 67.

Black, shining, head in both sexes wider than the thorax, face clothed with rather long white hairs; vertex with brownish hairs. Thorax rather sparsely punctured, clothed with scattered brownish hairs above; sides thickly clothed with white hairs. Wings slightly dusky, with the 1st recurrent nervure springing from nearly the centre of the 2nd submarginal cell. Scutellum with only a few very scattered punctures, but with a line of punctures down its centre; metathorax clothed with white hairs. Abdomen ovate, very shining, the basal segments with very fine scattered punctures; the rest more densely punctured at their base, but having the extreme apex smooth and impunctate; 2nd and 3rd segments with a white lateral fringe at the apex; 4th with an entire white apical band; 5th densely clothed with white hairs at the apex in the ♀, sparsely so in the ♂; 6th, in the ♀, covered with brownish hairs. Legs black, tarsi in the ♂ entirely testaceous, in the ♀ described from with only the apical joints pale. Scopæ in the ♀ silvery-white.

Length, 7—9 mill.

Flying about the flowers, &c., of the heath at Burrow Hill, Chobham, July and August.

This species can only be confounded with *coitana*, and from this, the black clypeus and testaceous tarsi at once separate the ♂, the ♀ are more alike; but the head in *lucens* is wider, the face covered with white hairs, the thorax more hairy, the scutellum almost impunctate, instead of being rugosely punctured all over, as in *coitana*, the body wider at the base, and, therefore, more egg-shaped; the 4th segment with an entire band of white hairs, and the scopæ white, instead of brown. It appears from Imhoff that the colour of the legs varies greatly, the tibiæ being often red.

Holmesdale, Upper Tooting:

7th August, 1880.

ON AN UNDEFINED FACULTY IN INSECTS.*

BY J. H. FABRE.

Ammophila, boring its mine until a late hour of the day, abandons its work after having closed the opening of it with a stone, rambles from one flower to another, goes to a distance, and yet knows how to return on the next day with its caterpillar-prey to the excavated domicile, although the localities may be new and unknown. *Bembex*, laden with its prey, falls with almost mathematical precision on the threshold of its doorway obstructed with sand and confused with the rest of the sandy covering. Where my observation and memory are defective, their *coup d'œil* and remembrance have a certainty which is all but infallible. It may be said that there is in an insect something more subtle than the simple faculty of remembering—a kind of intuition of localities without analogy in man—in fact, an undefinable faculty which I term memory, for want of an expression to designate it. The unknown cannot have a name. In order, if possible, to throw a little light on this point of the psychology of animals, I instituted a series of experiments.

The first had for its subject *Cerceris tuberculata*, the hunter of the *Cleoni*. About ten o'clock in the morning, I captured twelve females which were occupied on the same slope, in the same *bourgade*, either in excavating or provisioning the burrows. Each prisoner was separately enclosed in a cornet of paper, and the whole were put in a box. I then went about two kilomètres from the nests and there released the *Cercerides*, first taking care, in order to recognise them hereafter, to mark each one with a white spot in the middle of the thorax by means of the end of a straw dipped in indelible colour.

The *Cercerides* flew only a few paces in all directions, to and fro; rested on the sprigs of the herbage, passed for a moment their anterior tarsi over their eyes, as if dazzled by the bright sunshine into which they were suddenly brought, then took flight, some sooner others later, and all, without any hesitation, went in a direct line towards the south, that is to say, in the direction of their home. Five hours later I revisited the place where the nests are common, and, on arrival, saw two of my *Cerceris* with the white mark working at the burrows; soon after a third came into the field with a *Cleonus* between its feet; and a fourth soon followed. Four out of twelve in less than a quarter of an hour were enough for conviction, and I deemed it useless to prolong my attention. What four had known how to do the others would do

* Translated from "Souvenirs entomologiques." Vide page 117, *post*.

if they had not already done; and it is very permissible to suppose that the eight absent ones were delayed on their way by hunting their prey, or had already retired to the depths of their galleries. Thus, transferred to a distance of two kilomètres in a direction and by a means of which they could have had no knowledge at the bottom of their paper prison, my *Cercerides* had returned, in part at least, to their home.

I do not know to what distance the *Cercerides* extend their hunting, and it may be that within a radius of two kilomètres the country is more or less known to them. If they had not been carried far enough at the place to which I had transported them, they would then regain their home by their acquired acquaintance with the locality; so the experiment had to be repeated, with a greater intervening distance, and a place of departure that could not be suspected of being known to the hymenopteron.

At the same group of burrows from which I had drawn in the morning I then took nine female *Cerceris*, of which three had been subjected to the preceding experiment, and the transportation was effected in the darkness of a box, each insect being shut up in a corner of paper. The point of departure selected was the neighbouring town of Carpentras, distant about three kilomètres from the burrows. I determined to release my insects not in the midst of the fields, as at the first time, but in the public street, in the centre of a populous quarter, to which the *Cercerides*, with their rustic habits, had certainly never penetrated. As the day was already advanced, I deferred the experiment, and my captives passed the night in their cellular prisons.

The next morning, about eight o'clock, I marked them on the thorax with a double white spot, in order to distinguish them from the former captures, which bore only a single spot, and I set them at liberty, one after the other, in the middle of the street. Each released *Cerceris* rose up vertically between the two rows of houses, as if to disengage itself as quickly as possible from the defile of the street and obtain the wide horizon; then, clearing the roofs, it launched out immediately with a hasty flight towards the south. It was from the south that I had brought them into the town; it was at the south they would find their burrows. Nine times, with my nine prisoners set free one after the other, I had this striking example of an insect, carried into a district entirely new to it, not hesitating as to the direction it should take to return to its nest.

Some hours later I was at the burrows. I saw several *Cerceris* of the first lot, recognisable by the single white spot on the thorax, but

I saw none of those I had lately released. Had they not known how to regain their home? Were they on a hunting expedition, or had they really concealed themselves in their galleries in order to calm the emotions of such a trial? I do not know. The next day I made another visit, and this time I had the satisfaction of finding five *Cerceris*, with a double white spot on the thorax, as actively at work as if nothing extraordinary had happened. A distance of at least three kilomètres, the town with its houses, its roofs, its smoky chimneys—things all new to these free countrymen, had been no obstacles to their return to their nest.

Taken out of its flock and transported to enormous distances the pigeon promptly returns to the dove-cot. If we draw a proportion between the length of the passage and the bulk of the creature, how much the *Cerceris* transported to a distance of three kilomètres and returning to its burrow will be superior to the pigeon! The bulk of the insect is not a cubic centimètre, and that of the pigeon amounts to quite a cubic decimètre, if it do not exceed it. The bird, a thousand times larger than the hymenopteron, should, in order to rival it, regain the dove-cot from a distance of 3000 kilomètres, three times the length of France from north to south. I do not know that a traveller-pigeon has ever accomplished such a feat. But power of wing, and still less clearness of instinct, are not qualities to be measured by the mètre. The relations of bulk cannot here be taken into consideration, and we can only see in the insect a worthy rival of the bird without deciding which has the advantage.

To return to the dove-cot and the burrow. When the pigeon and the *Cerceris* are artificially removed from home by man and transported to great distances into regions hitherto unvisited by them, are they guided by remembrance? Can memory serve them for a compass when, arrived at a certain elevation, they may recover the lost point and start forth, with all their power of flight, on the side of the horizon where their nests are to be found? Is it memory which traces their route in the air to traverse regions they see for the first time? Evidently not; there can be no remembrance of the unknown. The hymenopteron and the bird know not the places in which they find themselves; nothing can have informed them of the general direction in which their displacement can have been effected, for it was in the darkness of a close basket or of a box that the journey was made. Locality, orientation, are unknown to them; nevertheless, they are found again. They have, then, for guide more than simple remembrance; they have a special faculty, a kind of topographical sense, of which it is impossible for us to have any idea, not having anything analogous to it.

NOTES ON THE ENTOMOLOGY OF PORTUGAL.

II. *PSEUDO-NEUROPTERA* (IN PART) & *NEUROPTERA-PLANIPENNIA*

BY R. McLACHLAN, F.R.S., &c.

As a first instalment toward the working-out of the materials collected in Portugal by the Rev. A. E. Eaton—who published Introductory Notes on his tour in the last No. of this Magazine (pp. 73—79),—I submit a List of certain of the *Neuroptera*. The *Planipennia* are complete, but the *Pseudo-Neuroptera* yet want the portions relating to the *Perlida* and *Ephemerida*, which will probably be furnished hereafter (either wholly or in part) by Mr. Eaton himself. The *Trichoptera* (which formed by far the bulk of the collection) are so rich in new forms, that it may probably be found impossible for them to appear in this series of notes in the first instance, but a List, with localities, &c., will be hereafter given, so as to maintain the uniformity of the series.

Mr. Eaton attended only very casually to the insects treated upon in this paper, but the discoveries are valuable, for, with the exception of some of the *Odonata* (of which De Selys indicated 17 species as Portuguese in 1850, most of which are not the same as those here enumerated), almost everything here is noticed as Portuguese for the first time. Perhaps the most interesting are *Myopsocus Eatoni*, *Gomphus Graslini*, *Amphizschna Irene*, and *Sisyra Dalii*, the first especially, as adding a genus to the European Fauna.

PSEUDO-NEUROPTERA.

TERMITIDÆ.

Termes lucifugus, Rossi.—One winged ♀ found drowning in a reservoir at Cintra, 27th April, the only winged *Termes* seen during the tour. Also soldier and larva found under a stone at the foot of a chestnut tree at Ponte de Morcellos, the only occasion upon which apterous forms were noticed.

PSOCIDÆ.

Myopsocus Eatoni, n. sp.

Head yellowish-grey, rather thickly spotted with deep black, the ocelli placed in a larger black spot, front with somewhat undulating deep black longitudinal lines, closely placed, those in the middle shorter than the others; labrum blackish, with a central yellowish spot. Antennæ whitish-yellow, pilose, the apex of each joint more distinctly whitish, preceded by a broad ante-apical black band. Palpi blackish, with pale rings. Thorax and abdomen fuscous, varied with yellowish (or *vice versa*). Legs yellowish: coxæ blackish; trochanters with a fuscous mark; femora fuscous or blackish externally, with indications of two maculose ante-apical black

rings; tibiae finely spotted with black, and with a broad apical black ring; tarsi having the 1st joint pale, the 2nd and 3rd blackish. Anterior-wings semi-opaque, grey, thickly spotted and clouded with fuscous, *but with a very distinct curved median pale space under the "forked" vein*; the costal margin and all the neuration closely spotted with deep black; pterostigma triangular, not darker, but with a faint yellowish (or greenish) tinge; extreme apex slightly reddish. Posterior-wings greyish-hyaline, with darker neuration, and a darker greyish clouding along the inner margin.

Expanse, about 8 mm.

[Notes on the recently-killed insect, made by Mr. Eaton, prove that the body-colours are much changed: according to these notes, the head is greenish-ochreous (with the black spots and lines above noticed); the ground colour of the antennae pale greenish-grey. Eyes dark greenish-grey, freckled with black. Thorax above greenish-grey, freckled with black; sides for the most part black. Abdomen above dull greenish-ochreous, the penultimate segment fuscous; there is a fuscous spiracular line on each side, a dorsal fuscous line, and obsolete fuscous lines on each side of it].

One example (probably ♂) on a bridge over a stream near Silves, Algarve, 16th May.

N.B.—The genus *Myopsocus* (Hagen, 1865) is new for the European Fauna. It has the neural characters of *Psocus*, but has 3-jointed tarsi, and thus stands in the same relative position with regard to *Psocus* as *Elipsocus* does with regard to *Cæcilius*. The described species are *M. lugens*, Hagen (N. America), *unduosus*, Hagen (Ceylon), *griseipennis*, McLachl. (Australia), and *fraternus*, McLachl. (Assam). Hagen indicates a species from Fiji, and I have one from New Zealand. All are remarkable (and *M. Eatoni* is no exception) for the coloration, which approaches that of *Psocus variegatus*. Mr. Eaton's discovery of a European *Myopsocus* is of the greatest interest.

Stenopsocus cruciatus, L.—One example from Silves.

Cæcilius flavidus, Stephens.—One example from Ponte de Morcellos, 12th June.

ODONATA.

LIBELLULINA.

Platetrum depressum, L.—One adult ♂ from between Coimbra and São Antonio, 3rd June.

Sympetrum striolatum, Charp.—Two ♀ from a hill S.E. of Silves, 16th May, and two ♀ from between Coimbra and São Antonio, 3rd June; all immature.

GOMPHINA.

Onychogomphus forcipatus, L.—One ♂ and one ♀, São Marcos da Serra, 23rd May, one ♂, Ponte de Morcellos, 12th June. These are

somewhat intermediate between the ordinary northern form and the southern race known as *unguiculatus*, V. d. Lind., but more approach the former; the inferior appendages of the ♂ are totally yellow.

Gomphus Graslini, Rambur.—One ♀, Cea, 1692 feet, 8th June. This very local species has hitherto only been known from the west of France. The Portuguese ♀ appears to agree sufficiently with the description.

Gomphus pulchellus, Selys.—One ♀, São Marcos da Serra, 23rd May, one ♀, on the road from Lisbon to Cintra, 31st May.

Cordulegaster annulatus, Latr.—Cea, one ♂ and one ♀, 9th and 11th June, one ♂, Salamonde, 30th June, over 2000 feet. Of the typical northern form, and not approaching the race *immaculifrons*, Selys, usual in the South of Europe.

ÆSCHNINA.

Amphießchna Irene, Fonsc.—One ♂ at a stream near Agualva on the road to Cintra, 31st May. A very interesting addition to the Fauna of the Iberian Peninsula. This species is the sole European representative of an otherwise exotic group of forms.

CALOPTERYGINA.

Calopteryx splendens, Harris (race *xanthostoma*, Charp.).—One adult ♂ from near São Marcos da Serra, 22nd May.

Calopteryx virgo, L. (race *meridionalis*, Selys).—One somewhat immature ♂, from the Estrella, 5th June.

Calopteryx hæmorrhoidalis, V. d. Lind.—One ♂ and two ♀, near Monchique, 18th and 19th May, one ♂, between Coimbra and São Antonio, 3rd June; the latter approaches the form usual in the South of France.

AGRIONINA.

Platycnemis acutipennis, Selys.—Two ♂, near São Marcos da Serra, 22nd May.

Ischnura Graellsii, Rambur.—One ♂ near Lisbon, 22nd April, two ♂ and two ♀ near Almodovar, 7th and 8th May, one ♀, São Marcos da Serra, 22nd May. There is some amount of variation in these individuals: in the ♂ from Lisbon, and in two of those from near Almodovar, the blue humeral lines on the thorax are totally obliterated; in another ♂ from the latter locality they are continuous but narrow: in a ♀ the 8th segment is totally black above, in another ♀ it is blue for the greater part.

Agrion puella, L.—Two ♂, São Marcos da Serra, 22nd May.

Agrion Lindeni, Selys.—One ♂ from Aldea de Neuves, 8th May, one ♀ near Lisbon, 23rd April.

Pyrrhosoma minium, Harris.—One ♀ from the slopes of Picota, 20th May, three ♂, Ponte de Morcellos, 14th June.

N.B.—Of the fifteen species of Dragon-flies here recorded, the following were indicated as Portuguese by De Selys in his "Revue des Odonates," 1850, viz.: *S. striolatum*, *O. forcipatus*, *C. hæmorrhoidalis*, and *I. Graellsii*, but he noticed thirteen other species not caught by Mr. Eaton, so that twenty-eight species have now been recorded for the Portuguese Fauna.

All the fifteen species have been noticed in Spain, excepting *G. Graslini* and *A. Irene*. The number of recorded Spanish species is about forty-three, most of which no doubt also occur in Portugal.

PLANIPENNIA.

SIALIDÆ.

Sialis lutaria, L.—One ♀, Cintra, 27th April, in the ordinary condition. There is also one ♂ from near Salamonde, 2003 feet, 30th June, that I refer here with some hesitation. It has the dark coloration of *S. fuliginosa* (and even intensified), yet the anal structure is that of *lutaria*, only that the terminal ventral lobe appears slightly shorter, and slightly less obtuse at its apex. It is distinctly not the Spanish *S. nigripes*, Ed. Pict. (which I cannot separate from *fuliginosa*, *vide ante*, p. 62). At present, therefore, in the absence of sufficient materials, I am forced to consider it *lutaria*, with possibly slight modification in the anal parts, and with the coloration of *fuliginosa*.

CONIOPTERYGIDÆ.

Coniopteryx aleyrodiformis, Stephens.—Two examples from Olivaes, near Lisbon, 24th April, two from Cintra, 27th April. The antennæ are about 30-jointed, but in one sex (perhaps the ♀) the joints are shorter and thicker than in the other. Supposing this to be an actual sexual difference, it is clear that *C. tineiformis* must be distinct, and not a sexual form as I was once inclined to believe.

OSMYLIDÆ.

Sisyra Dalii, McLachlan.—Ten examples, nine from near Cintra, 31st May and 1st June, one from between Almodovar and São Barnabe,

12th May. These do not differ from English examples, excepting that the blackish axillæ of the furcations and the transverse veinlets are rather darker. The number of transverse veinlets is very variable.

HEMEROBIIDÆ.

Hemerobius subnebulosus, Stephens.—One ♂ from near Almodovar, 8th May, one ♂ from the slopes of Picota, about 1650 feet, 20th May, one ♀ between Coimbra and São Antonio, 3rd June, two ♂ from Cea, 1692 feet, 6th and 8th June. These are much less smoky than the ordinary British form.

Hemerobius limbatus, Wesmael.—Two from Cintra, 27th April, three from Cea, 8th June, one from Villa Real, 25th June; all ♀. They do not differ from British examples.

CHRYSOPIDÆ.

Chrysopa vulgaris, Schneider.—One example, Cintra, 1st June (also one example belonging to the Lisbon Museum).

Chrysopa septempunctata, Wesmael.—One example, Cintra, 1st June (also in the Lisbon Museum).

Chrysopa formosa, Brauer.—One example near Villa Real, 23rd June (also in the Lisbon Museum).

Chrysopa nigro-punctata, Ed. Pict. ?—Two near Cintra, 28th and 29th April, one near Cea, 11th June. Further materials seem to prove that *nigro-punctata* is not so distinct from *flavifrons* as it at first appeared to me (*vide ante*, p. 62), but I refer Mr. Eaton's examples to the former rather than to the latter.

Chrysopa Picteti, McLachlan (= *thoracica*, Ed. Pict., *vide ante*, p. 63).—One from between Coimbra and São Antonio, 3rd June, one from near Villa Real, 25th June. Fresh examples are deep green with a yellow dorsal vitta, not noticed in the original description of *thoracica*.

Chrysopa aspersa, Wesmael.—Seven examples from a hill S. W. of Almodovar, beaten from cork-oak, 8th May, one from Cintra, 1st June, one from between Cea and São Romão, 9th June, three from near Villa Real, 22nd, 24th, and 25th June. Excessively variable in the spotting of the thorax, &c., even in individuals from the same locality; mostly of small size as compared with examples from Northern Europe. I have never been able to satisfy myself that *prasina* of Burmeister is more than a strongly marked form, and if so, that name has priority over *aspersa*.

There is also a single example of another species of *Chrysopa*, distinct from any of those above recorded, from near Silves, 16th May, perhaps allied to *viridana*, but it is so discoloured that identification appears impossible.

ASCALAPHIDÆ

Ascalaphus latens, Rambur.—One male on a hill S. of Silves, 17th May (another seen), not quite of the typical Spanish form, but more approaching a variety from Catalonia described by De Selys in the *Compt. Rendus Soc. Ent. Belg.*, April 3rd, 1880.

PANORPIDÆ

Panorpa meridionalis, Rambur.—One ♂ and two ♀. Cintra, 27th April, one ♀; Sabugueiro in the Estrella, 5th June, one ♂, Cea, 9th June, one ♂ and one ♀ near Salamonde, 30th June. All the examples that I have seen from Spain and Portugal are smaller and less strongly marked than those from the French Pyrenees. It is the only *Panorpa* recorded from the Iberian Peninsula.

Lewisham, London: September, 1890.

ON THE SINGULAR NEW SPECIES OF *PLUTELLA* (ALLIED TO *P. CRUCIFERARUM*) COLLECTED IN SPITZBERGEN, IN 1873, BY THE REV. A. E. EATON.

BY H. T. STANTON, F.R.S.

The insects in question were placed in my hands more than six years ago, but pressure of business of various sorts has hitherto prevented my giving them the attention which they merited. Specimens were submitted to Professor Zeller, in 1874, who wrote his opinion on them May 20th of that year, but as he wished that his views on the specific distinctness of the specimens sent to him should be confirmed by myself, the matter has stood over till I had the necessary leisure to relax and set out the Spitzbergen specimens, which Mr. Eaton had collected.

I should premise that of all the *Micro-Lepidoptera*, I know of no more cosmopolitan species than *Plutella cruciferarum*, and, therefore, it would have appeared to me perfectly natural had it also occurred at Spitzbergen.

One other point to be noticed is the very peculiar markings on the antennæ of the normal *Plutella cruciferarum*, which, in bred specimens of the insect, are so strikingly conspicuous.

The stereotyped description of these antennæ is: "whitish, annulated with fuscous;" but the peculiarity is, that these fuscous annulations are occasionally confluent, and form fuscous patches, one of these is about the middle of the antennæ, and there are three more towards the tip. A similar character may be noticed in the antennæ of *P. annulatella*, and a modification of it in the antennæ of *P. porrectella*, for in this species there is no fuscous blotch in the middle of the antennæ, but only the three towards the tip.

Now, the peculiarity of the antennæ of these Spitzbergen specimens, for which Professor Zeller has proposed the name of *Plutella polaris*, is that the antennæ are entirely pale fuscous, with only faintly paler annulations, and this character appears perfectly constant in all the seven specimens I have before me, not a vestige of the dark patches in the antennæ is to be seen.

Professor Zeller's remarks, dated May 29th, 1874, are as follows:—"The two ♂ you send me as *Plutella cruciferarum* appear to me very remarkable. They are of the size of the largest *P. cruciferarum*; their antennæ are pale brown, paler annulated, very different in appearance from those of any true *P. cruciferarum*. Head and thorax (except the shoulders) pale griseous.

"The anterior-wings have the dorsal vitta pale griseous, obsoletely dentate interiorly, and rudely marked with black dorsal spots, and the cilia unicolorous pale griseous. The posterior-wings are broader towards the end than in *P. cruciferarum*, and, consequently, more suddenly pointed. If your other specimens agree in these particulars with the two now before me, they must certainly be a good new species, for which I should propose the name of *Plutella polaris*, with the following diagnosis:—

"*Antennis fuscescentibus obsolete dilutius annulatis, capite thoracisque medio fuscescenti-griseis; alis ant. cinereo-fuscis, vitta dorsali ochraceo-grisea ante medium obsolete sinuata, in margine grosse nigro-punctata, ciliis unicoloribus ochraceo-griseis; alis post. breviter acuminatis.*"

I would add that the anterior-wings seem to me decidedly broader than in the normal *P. cruciferarum*. All the seven specimens show distinctly the dorsal spots noticed by Zeller.

The Rev. A. E. Eaton captured these specimens July 21st and 24th, 1873, at Wide Bay, Spitzbergen.

Mountsfield, Lewisham :

September 13th, 1880.

DESCRIPTION OF A NEW SPECIES OF *BRAHMÆA* FROM JAPAN.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

Some years since, when I enumerated the species of *Brahmæa* (P. Z. S., 1866, pp. 118—121), I could only muster four, as follows:—

1. *Brahmæa Certhia*, Walk. (*nec* Fabr.), = *B. conchifera*, Butl.
2. „ *Whitei*, Butl.
3. „ *Petiveri*, Butl., = *Certhia*, Fabr.
4. „ *Lucina*, Drury.

Three more species have subsequently been added to the genus by myself, one by Felder and one by Rogenhofer; the *B. Wallichii* of Gray has also been recognised as distinct from the species with which it was formerly represented; the genus now stands as follows:—

SECTION I.

1. *Brahmæa Lucina*, Drury. Sierra Leone.
- *2. „ *Swanzii*, Butler. Fantee and Old Calabar.

SECTION II.

3. *Brahmæa Certhia*, Fabr. (= *lunulata*, Brem., = *Petiveri*, Butl.). Chusan; North China.
- *4. „ *Ledereri*, Rogenhofer. Asia Minor.
5. „ *Mniszechii*, Felder. Japan.

SECTION III.

- *6. *Brahmæa japonica*, Butler. Yokohama and Nikko.
7. „ *nigrans*, n. sp.

Nearest to *B. japonica*, but differing in its slightly smaller size, narrower secondaries and altogether blacker coloration; the white bands on the body are confined to the front of the head and collar; the back of the collar and margins of the tegulæ are grey, the remainder of the thorax above is black, the abdomen blackish-brown; the ground-colour of the primaries does not show the pink tint of *B. japonica*, but is sordid white, all the wavy black lines are wider, those across the disc being of a purplish-slate colour, the basi-costal area is broadly suffused with dark greenish-black; the central belt is very much constricted above the internal ocelloid patch, is of a dull greenish-white colour, and the little pupillated black spots upon it are more numerous, and, to a great extent, connected; the submarginal spots are more widely separated; the secondaries have a much narrower basal area, less suffused with blackish (not black) than in *B. japonica*, the belt which limits it externally is much more abruptly angulated, of a sordid white colour, and traversed by a simple greyish stripe; the disc is of a pale greyish-brown tint, is wider than in *B. japonica*, and the lines which traverse it are increased in number by one, and are of a dull purplish-brown colour; the submarginal wavy belt, is similar, but the outer border is distinctly narrower, and of nearly uniform width throughout: on the under-surface the prevailing colour is smoky-grey, the ground-colour showing no

trace of the bright sandy-yellow of *B. japonica*, the basal area is more suffused with blackish, the central whitish belt more conspicuous, the submarginal white undulated stripe sharply defined, and the outer border dark smoky-brown; the body below is smoky-grey, instead of ochreous: expanse of wings, 3 inches, 8 lines.

Japan (Coll. O. Janson).

It is unfortunate that the exact locality of this species cannot be ascertained.

*8. *Brahma Whitei*, Butler. Darjiling.

*9. „ *conchifera*, Butl. Silhet and Darjiling.

10. „ *rufescens*, Butl. N. E. Bengal.

*11. „ *Wallichii*, Gray. Nepal.

I have put an asterisk to those species represented in the National Collection.

British Museum: August, 1880.

DESCRIPTIONS OF TWO NEW SPECIES OF COLEOPTERA FROM CENTRAL AMERICA.

BY D. SHARP, M.B.

The two descriptions now sent for publication were drawn up by me several years ago, at a time when Mr. Belt submitted to me for examination certain portions of his important collection of Central American *Coleoptera*. Since that time the lamented decease of the talented scientist has occurred: and as his collections are now being studied for description of new species by specialists, it seems desirable to utilize by publication these descriptions which were made long since. The two species belong to well-known genera, viz., *Smilicerus* of the *Elateridae*, and *Tesserocherus* of the *Platypides*.

SMILICERUS BELTI, n. sp.

Elongatus, angustulus, sub-parallelus, tomentosus, niger, elytrorum basi, prothoracis lateribus, prosternique medio, fulvis; antennarum apice flavescens; elytris ad apicem evidenter spinosis.

Long. 8 mm., lat. 1½ mm.

Antennæ broad and flat, moderately long, densely pubescent, black, with the 11th joint yellowish, and the 10th dirty yellowish: 2nd and 3rd joints quite short and small, but the 3rd not so small as the 2nd. Head black, deeply punctured, with two patches of fine, scanty, yellowish pubescence on the middle: forehead limited in front by a curved raised line. Thorax very elongate, sub-parallel, the hind angles but little divergent, moderately produced, but their extremity truncate: the middle is broadly black, each side is brownish, and on this brown part is a band of yellowish or golden pubescence. Elytra elongate, striated, the striæ are more distinct towards the extremity, and are punctured, but the punctation is only distinct on the basal portion, their apex is truncate, the truncature being terminated on each side by a

distinct tooth; the basal portion of the elytra is brownish, but the apex is black, the black colour occupying nearly the half, the scutellum is also black, and the suture is very narrowly blackish. The under-side is black, with the middle and the hind angles of the thorax tawny, and the trochanters and extreme base of the femora are also of that colour: the last ventral segment is produced into a sharp tooth in the middle.

This species is closely allied to *Smilicerus Sallei*, Cand., but has the black colour at the extremity of the elytra more extensive, and differs also in other small respects, so that I had no doubt when comparing it with the type of *S. Sallei* in Mr. Janson's collection, that the two were distinct.

Found at Chontales, in Nicaragua, by Mr. Belt.

TESSEROCERUS BELTI, n. sp.

Sub-cylindricus, ferrugineus, sat nitidus, thorace parcissime punctato; elytris seriatim punctatis, interstitio tertio basi latiore, confertim granulato.

Mas, *vertex dense villosus, scapi antennarum processu funiculi insertationem valde superante, a basi ad apicem dense longeque villosus. Long. 11 mm.*

Fem., *vertex parcius villosus, scapi antennarum processu funiculi insertationem longe superante, a basi ad apicem longe sat dense villosus. Long. 10 mm.*

♂. Antennæ inserted on a long curved process, somewhat below its middle, this process is not clavate towards the extremity, but is very densely fringed with long pale hairs; the whole of the upper part of the head is also very densely set with such hairs. The thorax has, in the base in front of the middle, a patch of strigose punctures divided into two by a fine channel; the apex of the elytra has, in front of the vertical portion, a small tubercle on the alternate intervals, the vertical portion is densely set with hairs, and its margin simple.

♀. Antennæ inserted as in the male, but the process not quite so long, and its fringe not nearly so dense: the upper part of the head has only a few hairs; the patch of strigose punctures on the thorax is quite rudimentary. The elytra are rather shorter and rather broader at the apex, the sutural tubercles are separated by a wide depression, the vertical apex is less densely pubescent, and its margin is at the apex broadly explanate.

This remarkable member of the *Platypides* was found at Chontales by Mr. Belt, after whom I have the pleasure of naming it. It is one of the largest species of the family, and should be placed at the end of the genus near *Tesserocerus Spinolæ* and *insignis*, but should apparently form a distinct section, because the female, as well as the male, has the process of the scape much prolonged beyond the point of insertion.

Thornhill, Dumfries:
August 11th, 1880.

Vanessa Antiopa near Birmingham.—I saw *Antiopa* yesterday, stopped my carriage and tried to catch it in my hat, but failed to do so, I am sorry to say. It was close by Cannon Hill Park near here.—R. C. R. JORDAN, 105, Harborne Road, Edgbaston, Birmingham : *September 1st, 1880.*

Vanessa Antiopa near Virginia Water.—It may interest your readers to learn that a very good specimen of *V. Antiopa* was caught by a friend of mine, Mr. Montague, near Virginia Water, as early as August 15th, and after a series of adventures is now in my possession in excellent preservation.—HAROLD J. ADAMS, St. John's College, Cambridge : *September 4th, 1880.*

Vanessa Antiopa at Box Hill.—A young gentleman lately saw two examples of this butterfly at Box Hill, Surrey, but although he knew the species, yet being one of those persons who keep only one specimen of a species, he caught but one and left the other, for which latter proceeding he has been sadly upbraided by his acquaintances.—A. H. SWINTON, Binfield House, Guildford : *September 10th, 1880.*

Vanessa Antiopa at Herne Bay.—I took a fine specimen of the Camberwell Beauty on the 26th of August last, at sugar, in Herne Bay.—SAMUEL M'CAUL.

Vanessa Antiopa at Eastbourne.—A specimen was recently taken on a road in Eastbourne, and is now in my possession, though in rather a dilapidated condition.—A. WALKER, The School House, Norwich : *September, 1880.*

Vanessa Antiopa at Headcorn.—I captured a specimen of *V. Antiopa* not far from my house on August 24th.—A. E. STUART, Shenley House, Headcorn : *August 29th, 1880.*

Vanessa Antiopa in Devon.—A specimen of the Camberwell Beauty was captured in my garden yesterday. It was first seen resting on a fallen Quarrendon apple, to which, on being disturbed, it returned after a short flight, and was then caught.—JOHN ELLIS, The Elms, Chudleigh : *August 31st, 1880.*

Vanessa Antiopa in Kent.—*Vanessa Antiopa* has been twice taken in this neighbourhood in the first week of September, viz., once at Knowlton and once at Redville.—OXENDEN HAMMOND, St. Albans Court, near Wingham : *Sept. 7th, 1880.*

Vanessa Antiopa at Tonbridge.—I saw a very perfect specimen of the Camberwell Beauty whilst out driving on August 27th last. Not having a net with me, I was unable to catch it.—EDITH C. THOMPSON, Tonbridge.

Vanessa Antiopa in Berkshire.—I captured, a few days ago, a good specimen of the Camberwell Beauty. At the time I caught it, it was feeding on some rotten fruit. I have never before seen one in this locality. A day or two after, I heard of the capture of another specimen at a spot about seven miles from where I caught mine. Does this mean that this year is an unusually good one for the insect? My specimen is large and perfect, and with reference to the disputed point about the difference between British and foreign specimens, the rim around the wings is, in my specimen, a good creamy-white.—C. L. LINDSAY, Ardington, Wantage : *September 8th, 1880.*

There is also a single example of another species of *Chrysopa*, distinct from any of those above recorded, from near Silves, 16th May, perhaps allied to *viridana*, but it is so discoloured that identification appears impossible.

ASCALAPHIDÆ.

Ascalaphus beticus, Rambur.—One male on a hill S. of Silves, 17th May (another seen), not quite of the typical Spanish form, but more approaching a variety from Catalonia described by De Selys in the Compt. Rendus Soc. Ent. Belg., April 3rd, 1880.

PANORPIDÆ.

Panorpa meridionalis, Rambur.—One ♂ and two ♀, Cintra, 27th April, one ♀, Sabugueiro in the Estrella, 5th June, one ♂, Cea, 9th June, one ♂ and one ♀ near Salamonde, 30th June. All the examples that I have seen from Spain and Portugal are smaller and less strongly marked than those from the French Pyrenees. It is the only *Panorpa* recorded from the Iberian Peninsula.

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I should premise that of all the *Micro-Lepidoptera*, I know of no more cosmopolitan species than *Plutella cruciferarum*, and, therefore, it would have appeared to me perfectly natural had it also occurred at Spitzbergen.

One other point to be noticed is the very peculiar markings on the *antennæ* of the normal *Plutella cruciferarum*, which, in bred specimens of the insect, are so strikingly conspicuous.

The stereotyped description of these antennæ is: "whitish, annulated with fuscous;" but the peculiarity is, that these fuscous annulations are occasionally confluent, and form fuscous patches, one of these is about the middle of the antennæ, and there are three more towards the tip. A similar character may be noticed in the antennæ of *P. annulatella*, and a modification of it in the antennæ of *P. porrectella*, for in this species there is no fuscous blotch in the middle of the antennæ, but only the three towards the tip.

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"The anterior-wings have the dorsal vitta pale griseous, obsoletely dentate interiorly, and rudely marked with black dorsal spots, and the cilia unicolorous pale griseous. The posterior-wings are broader towards the end than in *P. cruciferarum*, and, consequently, more suddenly pointed. If your other specimens agree in these particulars with the two now before me, they must certainly be a good new species, for which I should propose the name of *Plutella polaris*, with the following diagnosis:—

"*Antennis fuscescentibus obsolete dilutius annulatis, capite thoracisque medio fuscescenti-griseis; alis ant. cinereo-fuscis, vitta dorsali ochraceo-grisea ante medium obsolete sinuata, in margine grosse nigro-punctata, ciliis unicoloribus ochraceo-griseis; alis post. breviter acuminatis.*"

I would add that the anterior-wings seem to me decidedly broader than in the normal *P. cruciferarum*. All the seven specimens show distinctly the dorsal spots noticed by Zeller.

The Rev. A. E. Eaton captured these specimens July 21st and 24th, 1873, at Wide Bay, Spitzbergen.

Mountsfield, Lewisham :

September 13th, 1880.

DESCRIPTION OF A NEW SPECIES OF *BRAHMÆA* FROM JAPAN.

BY ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

Some years since, when I enumerated the species of *Brahmæa* (P. Z. S., 1866, pp. 118—121), I could only muster four, as follows:—

1. *Brahmæa Certhia*, Walk. (nec Fabr.), = *B. conchifera*, Butl.
2. „ *Whitei*, Butl.
3. „ *Petiveri*, Butl., = *Certhia*, Fabr.
4. „ *Lucina*, Drury.

Three more species have subsequently been added to the genus by myself, one by Felder and one by Rogenhofer; the *B. Wallichii* of Gray has also been recognised as distinct from the species with which it was formerly represented; the genus now stands as follows:—

SECTION I.

1. *Brahmæa Lucina*, Drury. Sierra Leone.
- *2. „ *Swanzyi*, Butler. Fantee and Old Calabar.

SECTION II.

3. *Brahmæa Certhia*, Fabr. (= *lunulata*, Brem., = *Petiveri*, Butl.). Chusan; North China.
- *4. „ *Ledereri*, Rogenhofer. Asia Minor.
5. „ *Mniszechii*, Felder. Japan.

SECTION III.

- *6. *Brahmæa japonica*, Butler. Yokohama and Nikko.
7. „ *nigrans*, n. sp.

Nearest to *B. japonica*, but differing in its slightly smaller size, narrower secondaries and altogether blacker coloration; the white bands on the body are confined to the front of the head and collar; the back of the collar and margins of the tegulæ are grey, the remainder of the thorax above is black, the abdomen blackish-brown; the ground-colour of the primaries does not show the pink tint of *B. japonica*, but is sordid white, all the wavy black lines are wider, those across the disc being of a purplish-slate colour, the basi-costal area is broadly suffused with dark greenish-black; the central belt is very much constricted above the internal ocelloid patch, is of a dull greenish-white colour, and the little pupillated black spots upon it are more numerous, and, to a great extent, connected; the submarginal spots are more widely separated; the secondaries have a much narrower basal area, less suffused with blackish (not black) than in *B. japonica*, the belt which limits it externally is much more abruptly angulated, of a sordid white colour, and traversed by a simple greyish stripe; the disc is of a pale greyish-brown tint, is wider than in *B. japonica*, and the lines which traverse it are increased in number by one, and are of a dull purplish-brown colour; the submarginal wavy belt, is similar, but the outer border is distinctly narrower, and of nearly uniform width throughout: on the under-surface the prevailing colour is smoky-grey, the ground-colour showing no

trace of the bright sandy-yellow of *B. japonica*, the basal area is more suffused with blackish, the central whitish belt more conspicuous, the submarginal white undulated stripe sharply defined, and the outer border dark smoky-brown; the body below is smoky-grey, instead of ochreous: expanse of wings, 3 inches, 8 lines.

Japan (Coll. O. Janson).

It is unfortunate that the exact locality of this species cannot be ascertained.

*8. *Brahmæa Whitei*, Butler. Darjiling.

*9. „ *conchifera*, Butl. Silhet and Darjiling.

10. „ *rufescens*, Butl. N. E. Bengal.

*11. „ *Wallichii*, Gray. Nepal.

I have put an asterisk to those species represented in the National Collection.

British Museum: August, 1880.

DESCRIPTIONS OF TWO NEW SPECIES OF COLEOPTERA FROM CENTRAL AMERICA.

BY D. SHARP, M.B.

The two descriptions now sent for publication were drawn up by me several years ago, at a time when Mr. Belt submitted to me for examination certain portions of his important collection of Central American *Coleoptera*. Since that time the lamented decease of the talented scientist has occurred: and as his collections are now being studied for description of new species by specialists, it seems desirable to utilize by publication these descriptions which were made long since. The two species belong to well-known genera, viz., *Smilicerus* of the *Elateridæ*, and *Tesserocerus* of the *Platypides*.

SMILICERUS BELTI, n. sp.

Elongatus, angustulus, sub-parallelus, tomentosus, niger, elytrorum basi, prothoracis lateribus, prosternique medio, fulvis; antennarum apice flavescens; elytris ad apicem evidenter spinosis.

Long. 8 mm., lat. 1½ mm.

Antennæ broad and flat, moderately long, densely pubescent, black, with the 11th joint yellowish, and the 10th dirty yellowish: 2nd and 3rd joints quite short and small, but the 3rd not so small as the 2nd. Head black, deeply punctured, with two patches of fine, scanty, yellowish pubescence on the middle: forehead limited in front by a curved raised line. Thorax very elongate, sub-parallel, the hind angles but little divergent, moderately produced, but their extremity truncate: the middle is broadly black, each side is brownish, and on this brown part is a band of yellowish or golden pubescence. Elytra elongate, striated, the striæ are more distinct towards the extremity, and are punctured, but the punctuation is only distinct on the basal portion, their apex is truncate, the truncature being terminated on each side by a

distinct tooth; the basal portion of the elytra is brownish, but the apex is black, the black colour occupying nearly the half, the scutellum is also black, and the suture is very narrowly blackish. The under-side is black, with the middle and the hind angles of the thorax tawny, and the trochanters and extreme base of the femora are also of that colour: the last ventral segment is produced into a sharp tooth in the middle.

This species is closely allied to *Smilicerus Sallei*, Cand., but has the black colour at the extremity of the elytra more extensive, and differs also in other small respects, so that I had no doubt when comparing it with the type of *S. Sallei* in Mr. Janson's collection, that the two were distinct.

Found at Chontales, in Nicaragua, by Mr. Belt.

TESSEROCERUS BELTI, n. sp.

Sub-cylindricus, ferrugineus, sat nitidus, thorace parcissime punctato; elytris seriatim punctatis, interstitio tertio basi latiore, confertim granulato.

Mas, *vertice dense villosa, scapi antennarum processu funiculi insertionem valde superante, a basi ad apicem dense longeque villosa.*
Long. 11 mm.

Fem., *vertice parcius villosa, scapi antennarum processu funiculi insertionem longe superante, a basi ad apicem longe sat dense villosa.*
Long. 10 mm.

♂. Antennæ inserted on a long curved process, somewhat below its middle, this process is not clavate towards the extremity, but is very densely fringed with long pale hairs; the whole of the upper part of the head is also very densely set with such hairs. The thorax has, in the base in front of the middle, a patch of strigose punctures divided into two by a fine channel; the apex of the elytra has, in front of the vertical portion, a small tubercle on the alternate intervals, the vertical portion is densely set with hairs, and its margin simple.

♀. Antennæ inserted as in the male, but the process not quite so long, and its fringe not nearly so dense: the upper part of the head has only a few hairs; the patch of strigose punctures on the thorax is quite rudimentary. The elytra are rather shorter and rather broader at the apex, the sutural tubercles are separated by a wide depression, the vertical apex is less densely pubescent, and its margin is at the apex broadly explanate.

This remarkable member of the *Platypides* was found at Chontales by Mr. Belt, after whom I have the pleasure of naming it. It is one of the largest species of the family, and should be placed at the end of the genus near *Tesserocerus Spinolæ* and *insignis*, but should apparently form a distinct section, because the female, as well as the male, has the process of the scape much prolonged beyond the point of insertion.

Thornhill, Dumfries:
August 11th, 1880.

Vanessa Antiopa near Birmingham.—I saw *Antiopa* yesterday, stopped my carriage and tried to catch it in my hat, but failed to do so, I am sorry to say. It was close by Cannon Hill Park near here.—R. C. R. JORDAN, 105, Harborne Road, Edgbaston, Birmingham : *September 1st*, 1880.

Vanessa Antiopa near Virginia Water.—It may interest your readers to learn that a very good specimen of *V. Antiopa* was caught by a friend of mine, Mr. Montague, near Virginia Water, as early as August 15th, and after a series of adventures is now in my possession in excellent preservation.—HAROLD J. ADAMS, St. John's College, Cambridge : *September 4th*, 1880.

Vanessa Antiopa at Box Hill.—A young gentleman lately saw two examples of this butterfly at Box Hill, Surrey, but although he knew the species, yet being one of those persons who keep only one specimen of a species, he caught but one and left the other, for which latter proceeding he has been sadly upbraided by his acquaintances.—A. H. SWINTON, Binfield House, Guildford : *September 10th*, 1880.

Vanessa Antiopa at Herne Bay.—I took a fine specimen of the Camberwell Beauty on the 26th of August last, at sugar, in Herne Bay.—SAMUEL M'CAUL.

Vanessa Antiopa at Eastbourne.—A specimen was recently taken on a road in Eastbourne, and is now in my possession, though in rather a dilapidated condition.—A. WALKER, The School House, Norwich : *September*, 1880.

Vanessa Antiopa at Headcorn.—I captured a specimen of *V. Antiopa* not far from my house on August 24th.—A. E. STUART, Shenley House, Headcorn : *August 29th*, 1880.

Vanessa Antiopa in Devon.—A specimen of the Camberwell Beauty was captured in my garden yesterday. It was first seen resting on a fallen Quarrendon apple, to which, on being disturbed, it returned after a short flight, and was then caught.—JOHN ELLIS, The Elms, Chudleigh : *August 31st*, 1880.

Vanessa Antiopa in Kent.—*Vanessa Antiopa* has been twice taken in this neighbourhood in the first week of September, viz., once at Knowlton and once at Redville.—OXFORD HAMMOND, St. Albans Court, near Wingham : *Sept. 7th*, 1880.

Vanessa Antiopa at Tonbridge.—I saw a very perfect specimen of the Camberwell Beauty whilst out driving on August 27th last. Not having a net with me, I was unable to catch it.—EDITH C. THOMPSON, Tonbridge.

Vanessa Antiopa in Berkshire.—I captured, a few days ago, a good specimen of the Camberwell Beauty. At the time I caught it, it was feeding on some rotten fruit. I have never before seen one in this locality. A day or two after, I heard of the capture of another specimen at a spot about seven miles from where I caught mine. Does this mean that this year is an unusually good one for the insect? My specimen is large and perfect, and with reference to the disputed point about the difference between British and foreign specimens, the rim around the wings is, in my specimen, a good creamy-white.—C. L. LINDSAY, Ardington, Wantage : *September 8th*, 1880.

The abundance of Orgyia antiqua.—At this season the “Vapourer” is always one of the “common objects” everywhere, for, like the pig in Leigh Hunt’s story, “he goes up all manner of streets”—urban and suburban. But this year he has come out in prodigious numbers, almost rivalling *Plusia gamma* last year. I say *he*, advisedly, for as is well known, the females cannot fly for want of the *de quoi*. On every day, and all day long, lately, the males perform their gyrations about this house, half-a-dozen being at any moment in view from one window, and the same thing is going on in every direction. It was not so last year, and yet the larvæ in the early summer were very abundant, so that if the quantity of eggs of the last brood was, as is probable, not unusually numerous, the fates have been unusually beneficent to their products. What has been the proportion of females developed? This question, from the retiring nature of the ladies, can never be satisfactorily answered, nor shall we know how many of the gentlemen were involuntary celibates; but if the next generation be again in excess, we may presume that a large number of Benedicks found each a Beatrice; still, this is a hazardous speculation in view of the precedent of last year’s enormous broods of *Plusia gamma*, which have had no such successors this year.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: *September 4th*, 1880.

Description of the larva of Nonagria fulva.—In the “Manual of British Butterflies and Moths” *fulva* is said to be the commonest of the small species of *Nonagria*, and therein is given from Treitschke a brief description of the larva, yet it appears that in this country no one ever found the larva, until Mr. John Sang, of Darlington, while in quest of another species of larva, found this one, and meeting again with it in the following summer, proved its identity by breeding the insect, as recorded by him in last year’s October Number of this Magazine.

Most obligingly redeeming his promise made to me on that occasion, Mr. Sang has this season again sought successfully for the larva of *fulva*, and kindly sent me for study—first a very young example on the 19th of June,—secondly, on the 9th of July, four fine larvæ approaching maturity, affording me intense gratification in figuring this long-desired subject.

The habitude of the larva is to mine downward within the inner white lower part of the triquetrous flower-stem of *Carex paludosa*, a few inches more or less above the root while young, and nearer the root when full grown: it must be admitted that no external trace of its presence can be seen, for though a slight blackish discoloration does really exist, yet this is so completely masked by the close investing leaves as not to be detected without very strict examination.

When the first little larva arrived I saw it was laid up waiting to moult, and not liking to disturb it then, made no further search for another doubtful smaller larva reported to be in the stem, and this eventually proved to be a Coleopteron of carnivorous propensity to which *fulva* became a prey while in its helpless condition.

From the four larvæ of *fulva* more matured I took away, to figure and describe, the first pupa, which subsequently died from mismanagement during my absence; however, I had the satisfaction of breeding two fine moths on the 18th and 24th of August, and at this last date, while inspecting the plant for removal, I found the fourth, still a larva, though in the stage of changing.

The very young larva is smooth and glossy, of a creamy-whitish colour with a very distinct greenish dorsal vessel showing through the skin; at the stage more advanced it has deeper colouring and decided brownish stripes, as I learn from Mr. Sang.

When nearly or quite full-grown the larva measures from seven-eighths to about an inch in length: seen sideway or *en profile* it tapers very much anteriorly, and very little behind, but when viewed from above on the back it appears to taper only and very abruptly from the front of the third segment to the remarkably small flattened and taper head, the rest of the body being of uniform moderate stoutness though very slightly tapering near the hinder segment; all the segmental divisions are rather deep, and the subdividing wrinkles are deep on the third and fourth segments, slighter and more numerous on the others, and the skin much dimpled along the sides. It is of a pallid flesh-colour ground, having a deeper dirty flesh-coloured internal vessel sliding to and fro within the third, fourth, and fifth segments; the head is glossy, light brown, the mouth darker brown and ocelli black; the plate on the second segment is pale brown with rather darker front margin; the dorsal stripe is pale yellowish flesh-colour very softly defined between two broadish stripes of faint pinkish grey-brown, followed below by another broad stripe of the pallid flesh-coloured ground, and this again by a broad stripe of pinkish grey-brown, through which is visible the tracheal thread of dark grey whereon the black spiracles are situated: the rather rough anal plate is light brown, and a narrow plate also on the front part of the anal segment; the dusky brown tubercular dots are most minute, they are, as usual with internal feeders, largest on the twelfth segment, and these can just be discerned (with aid of a strong lens), and that each bears a short bristle; the ventral surface is pale flesh-colour, the anterior legs light brown, the whole skin shining. When about to pupate all the stripes disappear and the skin is of a porcelain-white strongly contrasted with the black spiracles.

The pupa is of a slender figure and measures five-eighths of an inch in length, very uniform in substance throughout, the thorax rather short and convexly rounded, the head sloping forward is prolonged with a slight tendency to a beak though rounded off at the very tip; the wing-covers short in proportion to the length of body, from the movable segments of the abdomen below them being longer than usual, the last three taper a little and end in a short blunt thorny projection: the colour is light brownish-ochreous with a faintly darker dorsal stripe, the anal projection dark brown and the whole surface very glossy.—WILLIAM BUCKLER, Emsworth: *September 10th, 1880.*

Bryophila par.—More than twenty years ago I took a pair of a *Bryophila* at Cambridge, which at the time seemed to me to present decided points of difference from *glandifera*, but both Mr. F. Bond and the late Mr. G. R. Crotch, who saw them, referred them to that species as a variety, and I submitted to their decision. I have taken one or two at intervals since; but, last year, having captured ten quite fresh, and observing new points of difference, I sent one to Mr. Barrett, who forwarded it to Prof. Zeller. The latter, at first, returned it as *glandifera*, var. *par*, but has since (Mr. Barrett informs me) agreed with him that it constitutes a distinct species. I will, therefore, now proceed to give, as far as mere description can do it, the main points by which, I think, the two species may be differentiated:

1st.—The lines and markings of *B. glandifera* are much more sharply and distinctly marked than in *B. par*, which has, so to speak, a more mealy look.

2nd.—Though the lines and markings of the two insects are exactly alike, *B. par* has all the lines starting as *dark spots* on the costa, and a decided dark line at the base of the cilia of both wings, but especially the hind ones.

3rd.—*B. glandifera* retains its green tinge after death, which continues for years, if excluded from light. *B. par*, which when fresh and alive is of a much paler green with often a beautiful pink tinge, fades directly it is killed, or when worn, to a dirty brick-colour.

4th.—While *B. par* has only, as far as I know, been taken in this country on old walls at Cambridge, *B. glandifera* is, I believe, a coast species.

Lastly.—*B. glandifera* runs slightly larger than the nearly allied species.

I may add that a form of *glandifera* occurs which has the mealy appearance and indistinct lines of *B. par*, but without the dark costal markings and base of cilia, which are always observable in the latter.

These differences may appear but slight, but to any one who sees a row of the two insects, they will, I feel sure, be sufficient to convince him of their real distinctness. I shall be much obliged to any one who will, next summer, send me full-fed larvæ of *B. glandifera* from the coast.—W. WAREEN, Park House, Stubbington, Fareham, Hants: *September 17th*, 1880.

Zelleria insignipennella bred.—In April of this year I beat a hibernated specimen of this insect from an isolated juniper bush in Headley Lane.

On May 17th I beat from the same bush a bright green larva, which was so like that of *C. costella*, that I was just going to throw it away, but remembering the capture of the previous month, I saved it. It spun up the same night and emerged in the middle of June, a fine ♀. As the insect is also taken where there is no juniper for some miles, it will probably be found to feed on some other plant as well.—ID.

Phosphæus hemipterus at Hastings.—On June 29th, I took two ♂ specimens of this rare beetle crawling up a wall in Cornwallis Gardens, Hastings.—E. A. BUTLER, Hastings: *September*, 1880.

Another Colorado Beetle!—The following amusing extract from the "Catholic Weekly Register," of August 21st, 1880, has been forwarded by a correspondent.—EDS. :—

"A Colorado Beetle, which flew in at a surgery door on Saturday, has been captured at Stranraer. It is said to be three-quarters of an inch in length. There was a quantity of larvæ on it when caught, and two days after a number of lively little beetles were disporting themselves on potato and cabbage leaves in their glass prison."

Capture of two of our rarer species of Homalota.—I caught a single specimen of *Homalota planifrons*, ♂, on the sand-hills, Hayling Island, last July, and two or three of *Homalota princeps* under seaweed, at Ventnor, in April, in company with a great number of *Philonthus fucicola*, &c. Dr. Sharp has kindly determined the species for me.—EDWARD SAUNDERS, Holmesdale, Upper Tooting: *September*, 1880.

Otiorrhynchus ligustici, &c., in the Isle of Man.—The following species of *Coleoptera*, found by myself near Ramsey during the last week of August this year, have not, so far as I can gather, been previously recorded from the Isle of Man: *Blethisa multipunctata*, *Amara patricia*, *Philonthus fuscicola*, *Otiorrhynchus ligustici*. *Dianthus* was plentiful in waterfalls, but I looked in vain for *Stenus Guynemeri* and *Quedius auricomus*. In fact, beetles of every kind were extremely scarce.—W. G. BLATCH, Green Lane, Smallheath, Birmingham: September 20th, 1880.

Prosopistoma punctifrons.—My colleagues, MM. Joly and Vayssière, in announcing, with justifiable pride, the discovery of the perfect insect of *Prosopistoma* (in the Comptes Rendus of the French Academy, and elsewhere), attribute to me the former possession of an opinion that the insect might be an Ephemeroidea suited for a continuous aquatic life. I am not sensible of having published such an opinion, nor of having held it. In my remarks on *Oniscigaster Wakefieldi*, in the Journal of the Linnean Society of London, vol. xii (Zoology), p. 145, foot-note (1873), I asked, "Can there be *apterous Ephemeroidea*? and can the imago of *Prosopistoma* be in that condition?" It did not occur to me that these words could be so translated as to bear the interpretation put upon them by MM. Joly and Vayssière. In congratulating my colleagues on their discovery, it is necessary to say that I make this explanation solely because certain of my correspondents ask me *where* I have published the opinion attributed to me.—R. McLACHLAN, Lewisham, London: 9th September, 1880.

Reviews.

SOUVENIRS ENTOMOLOGIQUES: ÉTUDES SUR L'INSTINCT ET LES MŒURS DES INSECTES: par J. H. FABRE: Paris, 1879. 324 pp., 8vo.

In this volume the author gives the results of his own assiduous observation, during many years, of the instincts and habits of many European *Hymenoptera* and of *Scarabeus sacer*. An account of the Mason-bee is prefaced by an excellent story of the way in which Natural Philosophy was once taught in a certain College; there is also a chapter on "La chasse aux Diptères;" and another chapter is devoted to a dramatic recital of the perilous incidents of an ascent of Mont Ventoux in Provence, for natural history exploration—an adventure that narrowly escaped having a tragic termination. All these studies, as the author terms them, are full of novelty and are extremely interesting to the entomologist and physiologist, whether or not we follow the reasoning or admit the conclusions. The charm of the writing is irresistible: we give an extract on another page, but to be fully appreciated, the narratives should be read in the original, for much of the *esprit* evaporates in translation. The work is heartily to be commended to the attention of those who love entomology pure and simple.

Four species are described as new—*Cerceris Antonia*, *Cerceris Julii*, *Bombex Julii*, and *Ammophila Julii*:—the first dedicated to his daughter, the other three, in a few pathetic words, to the memory of his deceased young son, in whom a promising love of flowers and insects was early developed.

DIE LEPIDOPTEREN DER SCHWEIZ, von Professor Dr. HEINRICH FREY. Leipzig, Verlag von Wilhelm Engelmann, 1880. 8vo, 454 pp.

The idea of this book conceived in 1849, "in the sunny days" of the author's "youth" is now happily brought to a satisfactory completion.

Switzerland has for long been the holiday ground for all European Nations, and of late years our pages have shown the increasing number of English Lepidopterists who have spent some happy hours in collecting there. Its varied aspects and the inexpressible charm of its snow-mountains, with their brilliant Alpine Flora, offer a series of attractions, which those who have once experienced them will most readily admit are not easily resisted.

Any one can pass through life without entering Switzerland, but he who has once been there is almost certain to return thither.

The volume before us, very clearly printed (and on paper that it is an actual pleasure to touch), enumerates 2508 Swiss *Lepidoptera*, or if certain varieties (which by some are considered species) be included, the number will be raised to 2829. Like most of those, who have given their attention to the subject for any length of time, Professor Frey is disposed to extend his ideas of the limits of species farther than is generally customary. "Der Artbegriff ist in dem Nachfolgenden weiter ausgedehnt, als es bisher bei den Lepidopterologen (namentlich den industriellen) üblich ist."

Frey's volume is not a descriptive work; there are a few descriptions of new species and varieties, but the older, well-known species are simply mentioned by their long established names (the recent innovations introduced into the last edition of Staudinger's Catalogue, being placed between brackets), and a reference is given to a figure of Hübner, or Herrich-Schäffer, &c., thus, "*Hadena Polyodon*, L. (Monoglypha, Hufn.), (Hb. 82)."

The habits of the larva where known are given, and the months and special haunts of the imago; then follow the actual localities in which the species has been noticed and by whom, and stress is laid on its range in elevation, so that we see at a glance the extent to which any species occurs in the Higher Alps.

In a note at p. 266, we are reminded that the singular genus *Acentropus*, which can hardly fail to occur in such a well-watered country as Switzerland, has not yet been noticed there, although Reutti met with it on the Northern shores of the Lake of Constance. "But," says Frey, "who troubles himself there about such a small white thing."

It is remarked that none of the aquatic *Pyralidæ* attain any great elevation. Frey never saw one of that group at an Alpine Lake.

The introductory chapter, which speaks of the physical geography of Switzerland and its consequent wonderful varieties of climate within such short distances, ranging from the perpetual snow of the higher alps to Locarno on the shores of Lago Maggiore, where we have all the luxuriance of an Italian valley, is a fitting prelude to the work which follows.

The distribution of plants is also touched upon. Then the author starts the question: "Whence come the existing *Lepidoptera* of Switzerland?"

This is discussed through several pages, and then two other queries are pro-

pounded: "Has the Jura range a peculiar Lepidopterous Fauna?" and "Have *Lepidoptera*, which were originally alpine, in descending to lower elevations undergone modifications, transforming them to other species?"

Instances are given which would seem to answer the latter question affirmatively; but, just as the reader is charmed with the field of speculative thought he is entering, the Professor abruptly closes the subject: "Here we quit the enticing field of hypothesis. We turn to the more sober facts. We bring forth our Catalogue."

The following note to *Melitæa Dictynna*, at p. 29, will not be without interest to many of our readers:

"The *Melitæa*, which begin with *Dictynna*, belong to one of the most difficult sections of Lepidopterology. In the year 1878 I again devoted to it much time and labour. Through the kind aid of my friends and correspondents, Messrs. A. Schmid of Ratisbon, B. Möschler and J. Schilde of Bautzen, L. Cafilisch of Chur, W. M. Schöyen of Christiania, and others, with Staudinger's friendly assistance, I had before me for comparison and examination upwards of 300 specimens from the most varied localities. According to my opinion, only one species is sharply separated, namely, the old primary *M. Asteria*, Frr., belonging to the glacial epoch. From it next proceeded *M. varia*, Bi., which developed into *Parthenie*, H.-S. From the same alpine type *M. Aurelia*, Nickerl, is likewise derived. Both (*varia* and *Parthenie*) pass into the long-known *M. Athalia*, and, judging at least from northern specimens, there is no sharp demarcation between *Athalia* and *Dictynna*. I possess intermediate Swiss specimens. Between *Athalia* on the one hand and *Parthenie* and *Aurelia* on the other hand, with Schöyen's great mass of interesting material from Christiania and the Dovrefjeld, our usual differential characters founded on German specimens are left more or less in the lurch. In the meanwhile, in accordance with the usual system, I adopt the habitual list of species."

ZOOLOGICAL CLASSIFICATION: a handy book of reference, with tables of the Sub-Kingdoms, Classes, Orders, &c., of the Animal Kingdom, their characters and lists of the Families and principal Genera: by FRANCIS P. PASCOE, F.L.S., &c. Royal 18mo, pp. 328, second edition. London: John Van Voorst, 1880.

At p. 258 of Vol. xiii of this Magazine, we had occasion to notice the first edition of this work, and to point out how really useful it would prove as "a handy book of reference," a recommendation since abundantly justified by our own experience. The welcome with which the first edition was received, and the rapid advancement of Zoological science, have prompted the author to slightly re-model the first edition, and to bring out a second, in a much enlarged form, in which is shown how closely he has kept himself *au courant* with the literature of the subject, although there is too much evidence of inclination to follow one or two authors who, however eminent they may be in their special subjects, can have but little knowledge of the whole. Touching the Insecta, for to these our remarks must (as on a former occasion) be confined, we in some respects prefer the arrangement adopted in the first edition. We know not what induced the author to revert to the old intimate association of the true lice with the bird-lice, and in this respect consider his former ideas much to be preferred. We could object to other points in sequential and ordinal position; but we are fully alive to the *multitudes*

of opinions that exist. We might take great objection to the assertion that the only special auditory organs in insects are found in some groups of *Orthoptera*. We might object, also, to the *vagueness* of the remark appended to the *Curculionidae* (the author's speciality at this time), to the effect that it is "one of those groups in which many of the forms do not seem to be differentiated into species." But we cordially recommend the work as likely to prove of the greatest service as "a handy book of reference." Those who wish to form their own opinions must consult those authorities from whom the author acquired his.

The very marked increase in size of this edition (as compared with the first) results in part from a Glossary of nearly 40 pages, in which most of the terms used in the condensed characters and attributes are explained.

Those of our readers who possess the first edition cannot but have been struck with the evidences of laborious investigation exhibited in it (more especially if they have ever had occasion to attempt such work themselves); and this feeling will be intensified on an analysis of the second.

ENTOMOLOGICAL SOCIETY OF LONDON.—*September 1st, 1880.* H. T. STANTON, Esq., F.R.S., &c., Vice-President, in the Chair.

Miss Emily A. Smith, Assistant State Entomologist of Illinois, was elected a Foreign Member.

Mr. Weir exhibited a ♂ *Odonestis potatoria* in which the upper wing was for the most part coloured as in the ♀, and a ♀ with the coloration of the ♂. Also a variety of *Smerinthus populi*.

Sir S. S. Saunders exhibited six males of *Hylechthrus* bred from *Prosopis rubicola* from Albania, with other parasites bred from the same Bees (or from the briers in which their nests were made), and a new species of *Scleroderma* which he described as *S. ephippium*.

Miss E. A. Ormerod exhibited dipterous galls on *Tanacetum vulgare* found near Brentford. They affected various parts of the plants, but the most curious were on the inflorescence, individual florets becoming much enlarged and standing up far above the common receptacle. [Similar galls on the flowers of *Achillæa* have been attributed by Von Frauenfeld to *Trypeta stigma*.—EDS.]

Mr. Billups exhibited *Polyblastus Wahlbergi*, an ichneumon new to Britain, taken at Ashtead.

Mr. Boscher exhibited larvæ of *Smerinthus ocellatus* feeding on *Salix* and on apple, illustrating the variation apparently caused by the food-plant, those on the *Salix* being ornamented with brown spots which are absent in those on the apple.

Mr. Meldola exhibited specimens of *Camptogramma bilineata*, a large number of which had been found dead on the leaves of *Lycium barbarum* by Mr. J. English, attached to the leaves by a fungoid growth analogous to that which affects the common house fly.

Mr. Swinton communicated notes on the light of *Luciola* as observed by him at Turin, in which he affirms that when confined under separate tumblers they flashed their light "alternately and responsive."

DREPANA SICULA BRED FROM THE EGG.

BY WILLIAM H. GRIGG.

It is with much satisfaction I am at last able to record the above circumstance, through my having captured a worn ♀ moth on 4th of July, 1879, and her subsequent laying of thirty-nine eggs, attached to the edge of a leaf of *Tilia parvifolia*; and from these eggs twenty-five larvæ were brought successfully through their first moult by 3rd of August, when five of them were forwarded to Mr. Buckler, who reared three to full growth.

Hatched on the 17th and 18th of July, the little larvæ were at first very restless, unceasingly roaming to and fro over the lime leaves in the nearly air-tight jam pot I confined them in, where, one by one, many succumbed, as if from starvation, and it was not until the third day that I noticed any of the leaves had been attacked, when I was pleased to find some of the larvæ had commenced eating the upper surface close to the edge, and more particularly at the tip of the leaf.

Once got to settle down to their food quietly like rational beings, there was very little more prospecting to be observed, and the remaining larvæ fed up well: the first one spinning together a leaf for pupation on the 27th of August, and the last on 12th of September.

The pupæ were kept out of doors through the winter in an exposed situation, open to the north, and the first moth (a male) put in an appearance on 23rd of May, 1880,* and the next day three more, others followed, and the last on the 1st of June, making altogether sixteen specimens bred. In two instances the moths had not been able to escape from the cocoons, and the others were dried up.

Having now got both sexes out together, the next thing was to try if some of them would pair; the first attempt proved futile, but on placing a male and two females together, the desired end was attained at 10.30 p.m., and this again with three other females; one pair remaining *in cop.* forty-eight hours, an instance the more remarkable as the female laid only ten eggs, and they proved unfertile; the other pairs had separated between 8 and 9 next morning.

These females seemed loth to lay, and preferred to rest on the sides of the glass cylinder, rather than on the spray of lime it enclosed, and for three days scarcely moved, when, on an average, sixty eggs each were deposited on the edge of one or two leaves during the dusk of the evening without any kind of excitement; one moth piled hers up, as if a more equal distribution of the ova were needless fatigue.

* My first and earliest capture of specimens of *sicula* at large, consisted of a much worn pair on the 6th of June, 1874.

Their behaviour fully bore out the sluggish character of the moth when at large, so well known to myself and a few others: we never once having seen it on the wing; and thus in confinement, I noticed on every occasion they had never apparently shifted their position during the day, and only a little before dusk did they move quietly about; just as on a similar occasion, when I had five moths together confined in a cage less than a foot square, where, by 11 p.m., two pairs were *in cop.*, and separated next morning, without either having sustained injury worth mention.

After the experience of 1879, I looked forward to a still more successful rearing of the young larvæ this season, but, in fact, I fared even worse than before, my per centage of loss being very distressing; still, I am somewhat comforted to find the final result has not been entirely unsatisfactory; and am yet hopeful of being in a position next season to supply my friends with this moth.

51, Redland Road, Bristol:

28th September, 1880.

ADDITIONAL NOTES ON THE LARVA OF *DREPANA SICULA*.

BY WILLIAM BUCKLER.

In Vol. xiv, pp. 1—4, of this Magazine is a description of the egg and the larva of *sicula* when first hatched, also of the fully matured larva, and I now offer a few more observations to fill up the hiatus in the early part of its history, that the perseverance and kind help of Mr. W. H. Grigg have enabled me to give, and to thank him herein for both larvæ and ova.

The eggs are laid by the parent moth on the very edges of the leaves, so that when hatched her progeny shall find themselves exactly where their food is most suitable; for however much they may wander at first, it is there, in preference to any other part, the young larvæ invariably begin to feed, on the cuticle of the upper surface; there also they spin a small quantity of silk to rest upon and be secure while moulting.

After a moult, while the larva is but little more than one-eighth of an inch long, the future form is indicated, though the segments are strongly wrinkled and folded across at intervals, and the previous plain chocolate-brown colour is exchanged for russet-brown, relieved by minute dots and transverse bars of yellow.

After the next moult, the larva begins to cut quite through the substance of the leaves, eating out semicircular portions from the edge, it also begins to show on the brown ground-colour, little patches of

very subdued ochreous-yellow in angular forms on the back ; five days later it spins a quantity of silk, tying as it were the leaves loosely together, but firmly, for its safety while laid up for another moult, which is accomplished after two or three more days, and then it has the characteristic party-coloured coat of dark velvety-brown and pale cream-colour, the tubercular process appearing on the fourth segment as two short black eminences ; it soon spins more silk threads, keeping the leaves partly together, and feeds well until once more laid up for moulting, and this takes place after about a week from the previous change of skin.

Now the rosy-pink colour appears on the belly and ventral legs, and the yellow parts of the back have a thin brown dorsal and fine lateral lines, the yellow being much brighter than before ; three distinct shapes of yellow are seen on the back, well defined, and contrasted by the rich dark brown surrounding them, viz., a brilliant pale yellow triangular mark, its base at the beginning of the fifth segment its apex at the beginning of the sixth ; an elongated diamond-mark of deeper yellow extends from near the beginning of the seventh segment to near the end of the ninth ; another begins on the front of the tenth and includes the pointed tail, relieved on the twelfth segment with a brown chevron : as the larva grows, these yellow marks expand and become united into one long fluctuating shape along the back, as I have formerly described ; though I have since then had one variety retain the triangular mark isolated distinctly to the end of its larval existence ; and another with the yellow colour rather inclining to drab.

Having referred to my former account of this species, wherein mention was made of two young larvæ dying, rather than eat the lime supplied to them, and that yet only the year before a nearly mature larva had thriven on that food well enough, it is now needful to state that what seemed to me then so inexplicable, received afterwards an easy solution when Mr. Grigg sent me some lime gathered in the haunts of *sicula*, leaves whose smaller size, and qualities of texture and colour, were different from those the little larvæ rejected ; it was a great satisfaction, then, on visiting the trees where, without thought of any particular species of lime, I had first gathered food for the adult larva, to find they were *Tilia parvifolia*, and that *T. europæa* also grew at no great distance, to which, by a mischance, the next year at night my footsteps had been directed, an incident proving the importance of having the proper name, when allusion is made to trees or plants as food for larvæ.

Emsworth : October 10th, 1880.

REMINISCENCES OF ENTOMOLOGY IN SUFFOLK.

BY THE REV. A. H. WRATISLAW, M.A.

Having struck my tent in the east, and moved to the extreme west of the country, let me endeavour to wake up a few reminiscences of that best of entomological counties, Suffolk, and my own happy hunting grounds at Tuddenham St. Mary's (near Mildenhall) and its neighbourhood in particular.

It is about the 12th of June, the day is bright, the wind south-west, and everything invites the Entomologist, especially the Lepidopterist. Let us visit Tuddenham with its sands, its heath, its little marshes, and its fens. We start a good party in a break from Bury St. Edmunds, and, in about an hour and a half, approach the goal of our desires. We stop about half-a-mile short of the village, and send our conveyance on to the "Anchor." Then a *détour* is made to the right, and, in a few minutes, we are in the midst of rarities. *Lithostegia grisearia* is flitting about among the barley and in the neighbourhood of its food plant, the Flixweed (*Sisymbrium Sophia*); *Acontia luctuosa* hastens away as we approach; *Agrophila sulphuralis* darts rapidly from one position to another, and requires a practised eye to see, and a practised hand to catch it; *Heliothis dipsacea* careers wildly about, settling now and then on a flower, when it falls a victim to somebody's whirling net; and now and then *Acidalia rubricata* rises and flits before us, difficult to distinguish and keep in view on some barren patch of ground. Such are our captures on the way to Tuddenham. But we must hasten toward the marsh and fen, or *Melitæa Artemis* will have ceased to fly, whereas we can make another onslaught on *Agrophila sulphuralis* and some of its companions on our return. On we go, and proceed another half mile to the heath, marsh, and fen, or, as it is properly termed, the common. *Artemis* is abundant, as it is every now and then, and is flying vigorously on both heath and marsh, especially where a ring of birch trees form a kind of enclosure, which it particularly affects. Its food plant, the blue or devil's-bit scabious, is abundant everywhere, and I mentally make a note, that search must be made next month for the beautiful larva of *Macroglossa bombyliiformis*, which perhaps may be found by searching, in the same way as that of *fuciformis* is found on the low trailing bines of the honeysuckle. Now down to the fen, in the immediate neighbourhood of which a fair number of specimens of *Hydrelia unca* are captured flying among the long grass. But little else is now found except the brood of the larvæ of *Saturnia carpinii*, which has taken possession of quite a district of the meadow-sweet.

Now back to the "Anchor," walk on to the locality for *sulphuralis* and the rest, fill our remaining unfilled boxes, and home on the break to Bury St. Edmunds, well contented with our day.

It is the end of June, and another expedition is organized. *Hydrelia unca* is still on the wing in the fen, but *Agrophila sulphuralis* is getting ragged on the sand, and we find little but *Acidalia rubricata* to reward us. But, stay! as we return somewhat disappointed, we institute a search on the flowers of *Echium vulgare* and *Centaurea scabiosa*. On the former a beautiful specimen of *Dianthæcia irregularis* is found, and another moth, unknown to its captor, is brought me to be named. It is *Dicycla oo*, an insect which I had supposed to be a New Forest moth, and not an inhabitant of so open a country.

It is now July, and my pupils are gone home for their holidays, so I have to make my excursions by myself with one or two friends. There is nothing to speak of in the sandy district except *Spilodes sticticalis*, which is frequently very abundant, and sometimes very finely coloured. However, a friend takes a specimen of *Lytta vesicatoria*, and two or three *Cerambycidæ* are captured as they fly, to the satisfaction of the Coleopterists; but on the marsh and fen, towards 5 o'clock in the afternoon, out comes *Hyria auroraria* in fair number and excellent condition, and a very beautiful little insect it is in its purple and gold livery. But let me not forget to carry on the search for the caterpillars of *Macroglossa bombyliiformis*. I look for leaves of the blue scabious with holes bitten in them, and am several times disappointed as I turn them up, for other things bite holes in them occasionally besides the expected caterpillar. But patience and perseverance! Another and another plant is visited till I come to a region where there has evidently been a considerable deposit of eggs, and plant after plant yields a bright green larva with red markings on the sides, on the under-side of one of its leaves, and I return with nineteen caterpillars of *M. bombyliiformis* in my boxes. Those of *Lithostege grisearia*, too, swarm on the Flixweed, but are hardly worth rearing, so inferior are the bred specimens to those that are taken in their wild state.

With August comes the time for sweeping, and the abundant *Silene otites* yields its store of the caterpillars of *Dianthæcia irregularis*, with an occasional larva of *Heliothis dipsacea*. But the latter larva and that of *Heliothis marginata* abound more on the banks which edge the road through the open fields from Higham to Tuddenham. The imagos of *Eremobia ochroleuca* and *Agrotis valligera* are found on the *Centaurea scabiosa*.

I was not present when five beautiful specimens of *Vanessa Antiopa* were captured in a rough field adjoining Tuddenham Common by an old pupil (Mr. John Edwards), as they sucked the saccharine moisture from the trunks of some birches less stunted than those which grow on the common. But I had a glorious evening in a field about half-a-mile from Tuddenham, where a fresh brood of *Acidalia rubricata* appeared *en masse*, flitting about like pink and purple stars in the golden sunshine of the declining sun, about seven o'clock in the evening. So abundant were they, that I had twenty-nine choice specimens in my boxes, and a number more in my net.

It is now the middle of August, and a larva-hunting expedition is organized. Many a blow is dealt to the low birches and oaks that abound on the heath and marsh, and many are the caterpillars that fall into the umbrellas. That of *Notodonta dromedarius* is especially abundant on the birches, and so is that of *N. camelina* on both birches and oaks. *N. dodonæa* and *chaonia* also fell occasionally from the oaks; nor is it very often that the caterpillars of *N. dictæoides* with their long yellow stripe, and of *Acronycta leporina*, usually with white but now and then with yellow hairs, put in a welcome appearance. The larger leaved sallows produced *Dicranura furcula*, and *Salix repens* is in places studded with the neat little dwellings of *Clostera reclusa*. Occasionally, too, an oak will yield a welcome larva of *Drepana hamula*, and *D. falcataria* swarms upon the birches; nor is *Notodonta ziczac* absent from the sallows, or *Geometra papilionaria* from the birches. But we must not neglect the *Galium verum* in the sandy district, or miss the exquisite caterpillar of *Anticlea sinuata*, of which I have often taken a boxful, and which may be swept or searched for according to the taste or convenience of the Entomologist.

Such was Tuddenham in its palmy days; but now, alas! the professional collector has invaded it, and the amateur finds much less to reward him in the way of such larvæ as that of *Dianthæcia irregularis*. But the winged game is as abundant as ever, only it must be remembered, that many moths, *e. g.*, especially *Acidalia rubricata*, change their station according to cultivation, and are not found exactly in the same locality year after year. Let Tuddenham be visited in the second and last weeks of June, and, with favourable weather, the Entomologist will be pretty sure to see and find things there which he will not easily find in abundance in any other locality.

P.S.—I cannot remember, for certain, whether it was in July or August that an elm near Icklingham, in the same district, produced the exquisite little Tortrix, *Argyrolepis Schreibersiana*. I have, therefore, not included it among the captures of any special expedition.

Manorbier, Pembrokeshire.

PARTHENOGENESIS IN THE COLEOPTERA.*

BY J. A. OSBORNE, M.D.

In the "concluding remarks" in his treatise on "Wahre Parthenogenesis" (1856), von Siebold says, "Es ist daher jetzt Aufgabe der Entomologen, nach weiteren Beispielen von Parthenogenesis in der Insektenwelt zu forschen;" and on the last page (237) of his "Beiträge zur Parthenogenesis," published fifteen years later, he expresses the conviction that many facts relating to this phenomenon are still to be discovered. The instances of *true* parthenogenesis discussed or referred to in these two works relate to insects of the Orders of *Hymenoptera* and *Lepidoptera*, and to some crustaceans, including viviparous agamogenesis, however, as parthenogenetic, the orders *Hemiptera* and *Diptera* also furnish examples of this mode of reproduction; and for its occurrence in at least one genus of the *Trichoptera* I have the authority of Mr. R. McLachlan, F.R.S.† The possibility of parthenogenetic reproduction in the *Coleoptera* rests only, so far as I am aware—see "Comparative Embryology," by F. M. Balfour, vol. i, p. 64—on the single instance communicated by me to this journal last year (*Nature*, vol. xx, p. 430), and this being so, it seemed desirable to make sure of this point by further research during the season now almost past. Accordingly, I have this year kept a considerable number of females of *Gastrophysa raphani*, laying unimpregnated eggs, and with results which have not only confirmed the previous experience, but much extended it, as I am at present in possession of a living beetle reared from a parthenogenetic ovum. With your permission I shall now endeavour as briefly as possible to give those circumstantial details without which a bald statement of results would not carry with it a rational conviction of the accuracy of my observations.

From beetles gathered in the beginning of last April I had a batch of eggs on the 7th, which hatched out on the 21st of the same month, and on May 13th—15th yielded about thirty pupæ, which were immediately put into separate vessels. On the 20th—22nd appeared the imagines, of which ten subsequently turned out to be females, and were placed together in pots, but not before the greatly enlarged abdomen had given unmistakable evidence of their sex. The first eggs, three batches, were laid on June 2nd (so completing the cycle, from egg to egg, in fifty-six days). On the 12th of the month I found

* Re-printed from "*Nature*," Vol. xxii, pp. 509, 510.

† I fear Dr. Osborne has somewhat misunderstood some remarks of mine in a letter to him. I am very strongly disposed to believe that parthenogenesis exists in certain species of the genus *Apatania* in *Trichoptera*, but it is not proved. All we know is that although the females occur in abundance, no male has yet been discovered. This particularly applies to *A. mutiebris* and *A. arctica*.—R. McLACHLAN.

in one of these batches, consisting of forty-two eggs, thirteen developed, of which two hatched out, the larvæ dying shortly afterwards. Others seemed to have partly hatched, but most eventually perished in the shell. At this time fertilized eggs were hatching in nine days. It appeared to me that several of the thirteen were imperfectly or monstrously developed; one, for example, having only one misshapen (?) mandible; another, excess in number and irregularity in grouping of the eye-spots, &c., &c. Again, on June 17th, I found in a parcel of (twenty-five) eggs, laid June 6th—7th, six which had developed up to the hatching. In the usual course, at the time of hatching, the young larva comes out of the shell clear like barley-sugar, but blackens afterwards; in the case of these parthenogenetic larvæ which do not hatch out, this blackening takes place within the shell. In a third batch, of over twenty eggs, laid June 8th, I found three eggs similarly developed. In the meantime, and afterwards, many dozen batches had been laid, in which, however, I did not detect any development.

A second experiment miscarried; but I was more successful with a third and fourth. From a batch of eggs laid June 5th—6th, I derived pupæ which on July 8th following I placed separately in pots, and obtained from them thirteen beetles, of which seven turned out to be females. About the same time I brought in from the fields some well-grown larvæ, the beetles from which were isolated immediately after their exclusion, and subsequently yielded eight females. These (seven and eight) were all kept in separate pots during the course of the experiment. Of the seven no less than five laid eggs which afterwards developed parthenogenetically. They laid as many as ten parthenogenetic batches among them, but while some of them laid three such batches, others laid only one. These were invariably the first batches laid, and none of the batches laid subsequently contained any viable eggs while the experiment lasted, which was in some cases up to the tenth batch. Of the eight beetles of the fourth group, only one laid one parthenogenetic egg in its first batch. The number of parthenogenetic eggs in a batch varied from one to seven. In four batches there was only one such egg; in three batches five, and in the other four batches two, three, six, and seven respectively. The total eggs in a batch averaged 41.7, and as there were thirty-six parthenogenetic, the proportion over all was 1 in $12\frac{1}{2}$. However, as may be supposed, the proportion in the individual batches varied very much, one small parcel of only eleven eggs having as many as five developed.

In most of these cases also the larvæ perished in the shell. A

few hatched out more or less completely, and died. Two, however (of the seven in one batch), were more fortunate. These came out on July 29th, and for some hours seemed very feeble and barely alive. Next morning I found that one, which subsequently took the lead of its fellow in all respects, had crawled away under cover, and the other was able to follow its example. I could not find that they had eaten anything till the even of the 31st. After that, however, they thrived apace. The larger one passed its first and second moults on the 3rd and 7th of August, the smaller following it on the 4th and 8th. The former pupated on the 14th, and the imago was excluded on the 19th. The latter, having pupated, August 15th—16th, appeared to go on well till the time for the exclusion of the beetle, when its further development became arrested, and it died. The survivor was weakly at first, and rather imperfect always as regards the elytra, which are somewhat small, and do not close in the middle line. It has, however, thriven well, and developed that enlargement of the abdomen peculiar to the female. But up to the present (September 22nd) it has laid no eggs, nor shown any inclination towards males placed in the pot with it.

When it became obvious that no more parthenogenetic eggs were to be obtained from these beetles, I placed the survivors of them in succession in a pot with a (the same) male beetle, with the result that most afterwards laid fruitful eggs in the ordinary way. I mention this because it seems to be in contradiction, as far as these insects are concerned, with the statement of von Siebold ("Beiträge," p. 89): "Es ist nun eine bekannte Sache, dass, wenn Insecten-Weibchen vor der Begattung erst einmal Eier zu legen angefangen haben, ihre Männchen alsdann mit ihren verspäteten Liebesbezeugungen bei ihnen nichts mehr auszurichten im Stande sind."

If now I may be permitted to make a few general observations on some of the points indicated for further inquiry, rather than established, by the foregoing experiments, I would say: (1) that parthenogenesis seems to occur chiefly in the first-laid batches; (2) that it is peculiar to some females, while others appear to be exempt from it; (3) that confinement and domestication, as it were, acting hereditarily, which we already know so profoundly to affect the generative system in the higher animals, appear to favour this mode of reproduction in *Gastrophysa raphani*; (4) that there are degrees of viability in parthenogenetic embryos, so that the development seems to be arrested chiefly at certain points, as at the hatching of the egg and the exclusion of the imago. In this respect the *Gastrophysa* egg behaves very much as the ovum of *Bombyx mori* is reported to do (v.

"Beiträge," pp. 230—232); (5) another point in which *G. raphani* agrees with other parthenogenetically reproductive arthropods is its many-broodedness in a season. There may be three or four generations in direct succession in the year, and there is a constant succession of eggs all the time. In this it appears to differ from any of its allies with which I am acquainted. (6) Finally, the case of *G. raphani* would seem to be one of true parthenogenesis in its most restricted sense—the same beetle which in the unimpregnated state lays sterile eggs, with here and there one capable of development, after receiving the male element, laying eggs which are fertile and develop in the ordinary way. That is to say, the ova are true ova, and not pseud-ova or buds, the parent a perfect female and not an "Amme" like the summer Aphis.

Milford, Letterkenny, Ireland:
September 22nd, 1880.

DR. F. MÜLLER'S DISCOVERY OF A CASE OF FEMALE DIMORPHISM
AMONG DIPTERA.

BY BARON C. R. OSTEN-SACKEN.

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We owe to Dr. Fritz Müller, in Brazil, the important discovery of the hitherto unknown larvæ of the *Blepharoceridæ*, a very aberrant Family of *Diptera Nemocera*, of which a dozen species are at present known, remarkable for their sporadic distribution nearly all over the world (Europe, Ceylon, North and South America). In connection with this discovery of the larvæ, Dr. Müller publishes another very interesting and novel fact, the existence, in the species observed by him (which he names *Paltostoma torrentium*), of two sets of females, the one of which has the organs of the mouth built upon the plan of the trophi of blood-sucking *Diptera*, while in the other, as well as in the male, the mandibles are wanting. These females differ from each other besides, in the size of the eyes (separated in both cases, while they are contiguous in the male), and in the structure of the last tarsal joint. For details I refer to Dr. Müller's circumstantial and conscientious article in the October Number of the German periodical "Kosmos," and will only add, that these flies were obtained by Dr. Müller in large numbers by cutting open nearly ripe pupæ, but, as it seems, were never found in the open air.

As I have paid some attention to the Family of *Blepharoceridæ*, and am the only person who knows *de visu* all the described species (always rare in collections), I feel bound to make the following remarks, which suggested themselves to me in reading the above-quoted article.

Dr. Müller assumes, as results from the tenor of some passages (especially one on p. 41, left column), that in the *Blepharoceridæ*, as in a great many other *Diptera*, the eyes are contiguous in the male, and separated by a distinct front in the female. But it is just in this respect that the *Blepharoceridæ* differ from most other *Diptera*; their eyes are contiguous in some genera and separated in others, but when contiguous, they are so in both sexes, and when separated, likewise. The weight of this statement is qualified, it is true, by the circumstance that amongst twelve described species of *Blepharoceridæ*, only four are known in both sexes; of the other eight only the males are known, which execute aërial dances and are more frequently caught. It is possible, therefore, that the species observed by Dr. Müller differs from the cases hitherto known, and has the eyes contiguous in the male, while they are separated in the female. Moreover, Dr. Müller states explicitly that he examined the structure of the abdominal appendages of both sets of females, and found them to be the same in both. If it had not been for this statement, one might have suspected that the female without mandibular organs was in reality a male, and that the male with contiguous eyes belonged to a different species.

Another remark which suggests itself to me, is about the generic name of Dr. Müller's species. Dr. Schiner described a male *Paltostoma* as having separated eyes; *Paltost. torrentium* has them contiguous; this would, perhaps, constitute a difference of generic importance.

The statement, finally, that *Paltostoma* occurs in Europe, and has been found on Monte Rosa, is based upon some misconception. The *Blepharocera* discovered on Monte Rosa is *Hapalothrix*, a very abnormal genus in that abnormal Family; it has nothing in common with *Paltostoma* but a superficial resemblance in the venation. *Paltostoma* has been found in South America and Mexico only,

If this article should meet the eye of Dr. Müller, it will perhaps induce him to furnish us with more facts about this interesting question; mature imagoes should be caught, and the venation of their wings, as well as the structure of the genital organs, carefully compared.

Errors may easily occur. Thus, Macquart received from the same locality specimens with contiguous and separated eyes, and described them as sexes of the same species. It was found afterwards that they constituted different genera, and that the specimens with contiguous eyes (*Blepharocera*) were the females, while those with separated eyes (*Liponeura*) were the males; exactly the opposite of what one would have expected.

Persons desirous of more information about *Blepharoceridæ*, I

refer to Dr. Loew's article, "Revision der Familie der Blepharoceriden" (Schlesische Zeitschr. f. Entomol. Neue Folge, vi, 1877), and to my "Bemerkungen," &c., in the Deutsche entomol. Zeitschr., 1878, pp. 405—416. Only I beg that, in the latter article, p. 406, line 11 from top, after the word *Hinsicht*, the words *ausserhalb der Familie der Cyrtiden* should be inserted.

Heidelberg: October, 1880.

DESCRIPTION OF THE NYMPH OF *ARYTENA GENISTÆ*, LAT.

BY JOHN SCOTT.

Our knowledge of the earlier stages of the insects comprising the Family *Psyllidæ* has, until within the last few years, been of very limited extent, and whether this has arisen from the supposed difficulties attendant upon rearing the creatures, or from what other cause or causes I cannot say. My experience in rearing them has been quite a pleasure, and without the long anxious waiting attached to the rearing of *Lepidoptera*. The system I adopt is precisely similar to that adopted by me when I used to breed *Micro-Lepidoptera*, viz. :—a small flower-pot filled with earth, into which is placed a portion of the food-plant, the young are then put upon it, and the whole covered by a glass cylinder fitting into the rim of the flower-pot. Through the cylinder their actions may easily be observed, as also their habits. Some species live in a crypt formed by the deformation of the leaves occasioned by their attacks, and these are generally enveloped in a fine, flossy, cottony substance, whilst others roam about singly; perhaps the most active of all the young forms I have met with are those of *Arytæna genistæ*, Lat., the subject of the present paper, and they are included in the latter group.

The perfect insect had long been known in our collections under the name of *Psylla spartii*, Hartig (Germ. Zeit., iii, 1841), until I, in my Monograph of the British species of *Psyllidæ*, published in the Trans. Ent. Soc. for 1876, changed it to that of *Arytæna ulicis*, Curt., B. E., 565, 22a (1835), his name having priority by some years. It stood thus until 1879, when Dr. Franz Löw recognised it as the *Psylla genistæ*, Latr., Hist. Crust. et Ins., p. 384 (1804), and so he named and described it in the Verh. z.-b. Ges. Wien, p. 596. At the end of the synonymy, he adds "*Die Jugendstadien sind noch unbekannt.*" This expression set me to work to try and discover the earlier stages of this, one of the commonest species we have in England, or, perhaps, I may say, on the Continent. For several days, at the end of August

and beginning of the present month, I beat a large quantity of furzes (*Ulex europæus*) and broom (*Sarothamnus scoparius*), without any result, and I had almost despaired of obtaining the young, although the perfect insect was in swarms, until at last I observed one or two little creatures emerge from amongst some broom-leaves which I had beaten into an inverted umbrella. They appeared to be the object of my search, so I cut a few twigs of broom and put them and the insects together in my collecting bottle. On arriving at home, I turned them out into one of my breeding pots, and, in about a couple of days I had the satisfaction of seeing the first bred specimen of *Arytæna genistæ*. The pellets of excrement which they emit are large, milky-white, somewhat oval bodies, and are sometimes, I believe, joined together by a fine thread, or, perhaps, tube.

НУМРН.—Yellowish-green. *Head* broad, flattish, convex in front, with a few stout, long, black hairs in front. *Crown* dark brown, divided down the centre by a yellowish-green streak, widest next the base. *Eyes* large, pink. *Antennæ*: four basal joints yellowish-green, remainder black. *Thorax* yellowish-green, with two short, longitudinal black streaks on each side next the elytra-lobes, and five pairs of black foveæ placed more internally. *Elytra-lobes* brown, outer margin with about nine stout black hairs pointing somewhat anteriorly; disc with a few semi-erect black hairs running longitudinally. *Legs* yellowish-green, or sometimes brownish. *Tibiae* with a row of stout black hairs down the anterior margin. *Tarsi* black. *Abdomen* above yellowish-green, lower half brown, darkest next the margin; two basal segments with a black streak on each side in the incision; margin with a long, stout, black hair at the base of each segment, disc very sparingly clothed with black hairs; underneath yellowish-green, or sometimes of a pink colour in the centre, with two pairs of rectangular black patches; margins of the segments yellowish-brown.

Burnt Ash Hill, Lee:

September 18th, 1880.

Orgyia antiqua.—In the last No. of the Magazine I noticed a question by Mr. J. W. Douglas (p. 114), respecting the enforced celibacy of *Orgyia antiqua* ♂, from which it appears that he only allows one male to each female developed; this is without question what the study of other *Lepidoptera* would lead one to believe in, but in the case of the "Vapourer" there are lamentable exceptions to the general rule.

Some years ago I bred a number of specimens of this moth, carefully separating the sexes in the larva condition (which is easily done, owing to the different colour of the dorsal tufts); one of the females which I reared attracted no less than seven males in succession, all of which she mated with; finally she expired without laying a single egg.—ARTHUR G. BUTLER, 10, Avington Grove, Fenge, Surrey: October 2nd, 1880.

[Monogamy is believed to be the general rule with insects, although there are individual instances to the contrary. Mr. Butler's experiment shows what may happen under the abnormal conditions of the breeding-cage, and it is pos-

sible that similar results may occur where there is an excess of males in a state of freedom. Such an excess may exist sometimes, for Nature is prodigal of means to accomplish certainty in result; but the result of the perpetuation of a race would be defeated if such excess of males were not exceptional, if we may judge by the negative consequence of the polyandrous incident under notice. The subject is curious and worthy of wide experiment and observation, not only in this but other species of *Lepidoptera*, and also in species of other Orders. Polygamy in insects might also be a subject of research.—J. W. D.]

Vanessa Antiopa at Guildford.—One of these butterflies flew against my hat at noon yesterday, in the most fashionable part of Spital Street. It was as black as a coal with white fringe to its wings; was very quick in its movements and was over the chimney-pots in a twinkling.—A. H. SWINTON, Binfield House, Guildford: September 2nd, 1880.

Catocala fraxini near Lewes.—I had the pleasure of taking this fine insect on sugar near this town on 27th September last. The specimen is in fair condition, but had evidently been some time on the wing.—J. H. A. JENNER, 4, East Street, Lewes: October 19th, 1880.

Tapinostola Bondi at Lyme Regis.—Although probably most Lepidopterists are aware that *T. Bondi* is to be found in the neighbourhood of Lyme Regis, I do not think the occurrence of this species in Devonshire has been noticed in this Magazine. As the species is so extremely local, not only in this country but on the continent of Europe, it may be as well to record the fact of my finding it in abundance, in the beginning of July last, on the rough broken ground forming the slopes of the cliffs immediately to the west of the cement works at Lyme Regis, well into Devonshire.

It may be worth noting, that of the only two localities in this country from which this species has yet been obtained, one is in the south-east of Devon, and the other in the south-east of Kent.—H. GOSS, Gloucester: October, 1880.

[We think *T. Bondi* was first discovered at Lyme Regis by Mr. Wormald, as noticed in the "Zoologist," vol. xxi, p. 8861; it ought surely to occur elsewhere on the south coast between that place and Folkestone.—EDS.]

Xylina furcifera (conformis) bred.—Like my friend Mr. W. H. Tugwell, I have been tolerably successful in breeding the above. From ten eggs that hatched at the beginning of May, I succeeded in getting eight larvæ to pupate by the middle of July (the larvæ grew very slowly during the first month and then fed up rapidly). The first moth appeared the 17th of September and the last this evening, October 4th. Eight very fine examples.—WILLIAM H. GRIGG, 51, Redland Road, Bristol: October 4th, 1880.

Polia nigrocincta at sugar, in South Wales.—During the second week of September, while collecting in the South of Pembrokeshire, I took a specimen (♂) of *Polia nigrocincta* at sugar, in the middle of a small wood. It passed as *P. flavocincta* until compared with specimens of this moth, and its identity has since been confirmed by Mr. Barrett. The only previous record I can find of *P. nigrocincta* having been found in the perfect state is the report by Mr. Hopley (in E. M. M.,

November, 1867), of a specimen having being taken off the window of a lighthouse, near Padstow, in August, 1862.—G. J. HEARDER, Job's Well, Carmarthen: 30th September, 1880.

Micra ostrina at Dover.—On September 8th, I was fortunate enough to take a fine specimen of *M. ostrina* on Dover Cliffs. I was nearly passing it over as a *Crambus*, which it much resembles in its flight. I took it about eleven o'clock during bright sunshine.

My capture confirms an old note I owe to Mr. Bond, that this insect is double-brooded: though I understood from the Rev. Hy. Burney that nearly all the captures known have occurred in June or July.—BATTERSHELL GILL, Folkestone: September 23rd, 1880.

Capture of Micra ostrina, M. parva, and Noctua flammatra.—I have just added to my collection *M. ostrina* taken by a friend on the Dorset coast, and *M. parva* and *N. flammatra* taken at Freshwater by Mr. H. Rogers in July and August.—C. W. DALE, Glanvilles Wootton: October 5th, 1880.

Notes on the young larva of Triphana pronuba.—On the 5th of August last, some Lepidopterous eggs were sent to me for determination; they were on a stem of *Polygonum aviculare*, pearly-white, circular, with upper surface raised to a slight point. There was something in the look of them which seemed familiar to me and that it was some polyphagous animal was shown by my finding a batch of them on the flowers of *Lolium perenne*, on the 8th of August, yet I felt unable to guess at what they could be. However, as the pearly-white look was soon gone, and the eggs become duller and greyer, I felt I had not long to wait, and in due course there emerged some bristly, half-looping little larvæ, which I readily recognised as those of *Plusia gamma*.

I was accordingly not a little surprised when my querist informed me he had ascertained that the eggs he had sent me for determination were those of *Triphana pronuba*, a larva which is well known to have 16 legs, and with which most Lepidopterists are tolerably familiar.

On the 15th of August, I was rather startled to find a sprig of *Cryptomeria japonica* quite covered with these same eggs, and that same evening I found another batch on a dead lilac stem. As I was not disposed at once to abandon my *P. gamma* notion, I resolved to ascertain to a dead certainty what these eggs really were, and so sent a supply at once to Mr. Buckler, who, from his great experience in rearing from the egg, was tolerably safe to succeed where I should have probably failed.

On the 10th of September, I received from him the following notes, showing that the eggs were unquestionably those of *Triphana pronuba*, but that the larvæ when newly hatched have the two anterior pair of ventral prolegs ill-developed and do not use them when walking, thus causing their motions to resemble those of the genus *Plusia*.

"Eggs laid on *Cryptomeria* (received August 17th), close together, showing only the domed top of each, the ribs meeting in the centre, colour pinkish-grey (with dark blotch in the centre), increasing to almost leaden-grey; they hatched during the afternoon of the 19th August.

"The young larva resents in a testy way with some degree of pugnacity the being touched by a neighbouring larva, even while crawling away from the egg-shell. It is of a light grey colour, very pellucid, with blackish-brown head-plate, minute dot-

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and bristly hairs: by the third day after hatching the black acquires more colour of rather greenish-grey, the belly still translucent; the first two pairs of ventral legs are at first not in use and but little developed, and the larva often rests in a looping position and walks like a semi-looper. They readily feed on plantain, dock, and grass.

"After their *first moult*, on the 26th, when they were a week old, their bodies were of a drab-green, with the head and plate light brown, altogether less translucent, and with dark brown hairs as before, still looping without using the less developed first two pairs of ventral legs.

"By the 31st they had *moulted a second time* and now showed a pale spiracular stripe and the belly rather translucent, above on back and sides green with paler dorsal and subdorsal lines, head pale. Length $\frac{1}{4}$ inch, by September 3rd fully $\frac{3}{8}$ inch long with the green of the back more opaque, the pale lines edged with darker, especially above the pale spiracular stripe. Only a few of the larvæ at this date answer to this description, as many have yet to get over this moult.

"September 5th; 15 had *moulted the third time*, and were now possessed with all the characteristic markings of *Triphæna pronuba*.

"September 9th; a few had just *moulted the fourth time*, others waiting to moult."

Mr. Buckler kindly sent me with these notes one larva in the third moult and one in the fourth moult. These larvæ had now ceased to loop and used all their 16 legs in walking as a sensible larva of *T. pronuba* should do.

Having felt a lively interest in these larvæ from their semi-looping habit in infancy, I put the question to Mr. Buckler whether he was acquainted with any other newly hatched 16-legged larva, which were also given to semi-looping?

His reply to this query is of extreme interest:—

"In reply to your enquiry I can say that the larvæ of *Taniocampa opima* when young are semi-loopers, from not using the first two pairs of ventral legs, so also are the larvæ of *Phlogophora meticulosa* and no doubt those of many other species, but these are the latest instances I have observed."—H. T. STANTON, Mountsfield, Lewisham: September 15th, 1880.

Notes on Lepidoptera in Yorkshire in 1880.—At the end of the season it is natural and necessary to put our notes and captures together, so that we may see how we stand in relation to the science we take an interest in, and note whether we have anything worth recording. It is an observed fact that there is great variation in the appearance of insects. Species common to one year, are scarce the next, whilst others, which have been scarce for a year or more, again appear in great numbers; how to account for this irregularity seems in the present state of our knowledge scarcely possible: we should reasonably expect from an abundance of one season an increase in the next, and so on, but we find the reverse of this the case, species one year plentiful, the following wanting or rare. Speaking to a gentleman the other day this subject came under our notice; he suggested the idea that they were affected by atmospheric influence; the egg or pupal stage required certain conditions of atmosphere to suit their existence and bring them forward, and without these were present they would remain in a dormant state for a limited or lengthened period.

The following insects have being noticed by me as been common in this locality

this season: *Smerinthus ocellatus* and *populi*, *Sesia bembeciformis*, *Odonestis potatoria*, *Odontopera bidentata*, *Phigalia pilosaria*, *Amphidasia betularia*, and *vars.* *Acidalia aversata*, *Notodonta dictæa* (larva), *Leucania pallens*, *Xylophasia lithoxylea*, *Apamea gemina*, *Noctua rubi*, *Plusia chrysitis*, *Mania typica*, and *Agrotis suffusa*. Whilst others usually seen have not been represented, viz.: *Eriogaster lanestris*, *Pygæa bucephala*, *Cerura furcula* and *bifida*, *Notodonta dromedaria*, *Mamestra anceps*, and *Hadena suasa*. Others again have been taken sparingly: *Polyommatus phlæas*, *Bombyx quercus*, *Ennomos erosaria*, *Acidalia immutata*, *Collix sparsata*, *Abraxas ulmata*, *Hypsipetes ruberata*, *Eupithecia pimpinellata* and *frazinata*, *Acronycta tridens* and *leporina*, *Leucania conigera*, *Triphana janthina*, *Polia chi*, *Plusia iota*, and *Habrostola triplasia*. I have also taken the following for the first time: *Euchelia jacobæ*, larva on Ragwort, *Aplecta occulta*, *Miana litorea*, *Orthosia suspecta* visited sugar, *Pyrallis glaucinalis* in a spider's web, *Cryptoblabes bistriga* at rest on the trunk of an oak tree, *Gelechia ligulella*, *Swammerdamia caesiella* captured on the wing, *Argyresthia Gædartella*, *curvella* and *albistria* mothing, *Gracilaria Swederella* and *Elachista cerussella*, the latter I found flying over reeds and long grass in a boggy place, *Cerostoma scabrella* taken at rest on a hawthorn hedge, *Laverna epilobiella*, bred six specimens from larva taken on *Epilobium hirsutum*. Also several other species which are as yet undetermined.

Nepticula argyropeza taken as larva last year; I reared five imagos. *Coleophora currucipennella*, this species I incorrectly named in my last communication; having opportunity of showing it to Mr. Sang of Darlington, he referred it to *C. ardeapennella* of Scott, remarking that the cases of this species and *ibipennella* were similar in form, but that the former stood upright on the leaf while the latter was nearly prostrate; having taken both species I can speak to the same effect. I may mention also that *Trichiura cratægi* and *Triphana fimbria* have been taken in this locality, the first as larva the second at sugar.

I also had the pleasure of visiting Edlington Wood, near Doncaster, when I succeeded in obtaining a fine series of *Scoparia basistrigalis* and *Olindia ulmana*, also larva of *Pacilocampa populi* and *Hyponomeuta plumbella*, from the latter I have now a nice set.

On the 17th of this month, a fair specimen of *Vanessa Antiopa* was captured in a garden at Holgate, by Mr. Skilbeck, and given to me; it is larger than usual, measuring 3 inches 1 line in expanse of wing. On the 20th, I took *Agrotis saucia* and *Anchocelis rufina* at sugar, neither of which is common in this neighbourhood. On the 27th, a second specimen of *Vanessa Antiopa* was seen by myself in the nurseries here; it flew over some trees and settled down about six yards before me; I tried to get my hat over it but failed.—T. WILSON, Holgate, York: October, 1880.

Captures of Lepidoptera in the vicinity of London.—A short account of the insects I have taken in the vicinity of London this season may be of interest to some of your readers. Early in April *Micropteryx purpurella* and *semipurpurella* were common near Plumstead, and *M. unimaculella* on Wimbledon Common. In Headly Lane during the season I have beaten from Juniper *Zelleria insignipennella*, *Argyresthia praeocella*, *arceuthina*, *dilectella*, *aurulentella*, and *abdominalis*, the last being much the rarest: on August 31st, *G. semifascia* was common among the junipers in the neighbourhood of maples. Hampstead Heath produced *Coleophora*

albicostella in plenty, and *Lampronia luzella*: *Lithocolletis scopariella*, *Elachista subobscurella*, and *Trifurcula immundella* also turned up there, and at Barnes and Wanstead; and on oak trunks at this latter place I took a good series of *Laverna Stephensi*; *Gelechia gerronella* seems to be common wherever the furze grows: *Gel. pinguinella* was scarce, but occurred in the old locality. In Regent's Park I took, as usual, in plenty, *Gel. notatella*, *Laverna vinolentella*, *Prays Curtisellus*, *Gel. luculella*, and *albiceps*, and a few *G. leucatella*. *C. vittella* swarmed both here and in Hyde Park, where I also succeeded in securing five or six dozen *Tinea caprimulgella*. This insect is very lazy, very local, and fond of dark corners: it may often be found hanging in cobwebs, where it remains perfectly still, apparently secure from the attacks of spiders. *Ecophora augustella*, which is generally dispersed, was somewhat common at Wandsworth.

From cocoons found in the cracks of oak trunks at Wanstead, I bred a good series of *Cerostoma alpella*, and from larvæ and pupæ on *Convolvulus* at Lewisham, the same of *Bedellia somnulentella*. Other *Tineæ*, of which I obtained a few, were *Gel. velocella* at Barnes, *Gel. distinctella* at Sanderstead, *El. Gleichenella*, *Bedellella* and *stabilella*, *Pancalia Latreillella*, and *Stephensia Brunnichella* at Boxhill, *Argyresthia mendica*, *curvella*, and *pygmælla* at Pinner. The larvæ of *Cosmopteryx Drurella* occurred in profusion near Weybridge, and I now have a few small cases of *Nemotois Schiffermüllerella* from flowers of *Ballota nigra* collected at Gravesend: so that as far as *Tineina* are concerned, I have no reason to be dissatisfied with the past season. In *Tortrices* I have done very little: *Dichrorampha sequana* common near Ladywell Station and a beautiful *Carpocapsa splendana* at Croydon being the only ones worth mentioning.

Feeding on flowers and seeds of hemlock in Headly Lane, I got eight larvæ of an *Eupithecia* (of which seven were ichneumoned), green with a black head, of which I shall be glad to learn the name.—W. WARREN, Park House, Stubbington, Fareham, Hants: September 17th, 1880.

Pyroderces argyrogrammos bred.—My friend Baron von Nolcken spent last winter at Cannes and took home with him a number of pupæ of *Micro-Lepidoptera*. Many of the perfect insects emerged during his journey from the South of Europe to the coast of the Baltic, and were spoilt past recovery, but some fortunately continued in the pupa state till he was settled at home, and then, when they emerged, he was able to set out at his leisure in Russia, many of the little gems whose home was in more sunny regions. Among the insects that he bred rather freely was *Pyroderces argyrogrammos*.

This insect, first taken in Asia Minor by Professor Loew, and described in the *Isis* of 1847, by Zeller, who mentions that he had also met with it in Sicily and near Rome, has since been noticed in many parts of Southern Europe and occurs likewise in Hungary.

Till I heard from Baron von Nolcken that he had been breeding this insect, I was not aware that its transformations had been detected.

On writing to my friend for further details, he referred me to Millière's "Catalogue Raisonné des Lépidoptères des Alpes Maritimes," where at p. 359 he says of this insect "*Mai, Cannes; terrains crétacés des lieux arides. Très-abondante sur les chardons à fleurs jaunes (Carlina lanata), dont les chenilles rongent les graines.*"

On this hint, Baron von Nolcken says that he collected in December, when at Cannes, a number of thistle-heads, without, however, knowing anything of the colour of the flowers, which were then long out of bloom—the result was that he bred, as already mentioned, a fine series of *Pyroderces argyrogrammos*.

Any Entomologist who has friends in the South of France, might utilize their stay there by getting them to send home a lot of thistle-heads during the winter months.—H. T. STAINTON, Mountsfield, Lewisham: October 9th, 1880.

Noctua c-nigrum in June.—I took five specimens of *Noctua c-nigrum* in June, and a friend two specimens. I did not look upon its occurrence at that date as singular till I saw a notice in the August No. of the Ent. Mo. Mag. by Mr. Douglas (*ante* p. 70) of a specimen having been taken on June 27th.

I took four of the specimens on hedge-row trees at sugar, three of the others were netted; four of them were in fine fresh condition, all of which I have set out; the others had a worn appearance.

Most of the species of *Lepidoptera* that I have had experience of here have appeared on the wing considerably earlier than usual; but I have one instance in marked contrast to note, that being the capture of a very good male specimen of *Saturnia carpini*, which I took in bright sunshine on the 24th of June last.—A. ELLIOT, Samieston, Jedburgh, N.B.: September 15th, 1880.

[*Noctua c-nigrum* also appeared at Pembroke in June. There seems reason to suspect that if the autumn be unfavourable, this species does not emerge at its usual time, but lies over in pupa until the succeeding June. This may also be the case with *Agrotis suffusa*, and even *saucia*.—C. G. B.]

The destructive effects of Anisoplia austriaca in Russia.—The British Vice-Consul at Nicolaieff in a recent report says, "One of the most destructive insects in South Russia is the beetle *Anisoplia austriaca*, called by the rural population of Kherson *Couska*. This insect first appeared in 1865 in the Melitopol district, but there is nothing known as to how and whence it came, as it had never been heard of in any other part of Russia or bordering countries. The form of the insect is oblong and slightly convex; it is of the size of a grain of Ricinus-seed, and of a cinnamon colour. The change from egg to larva and from larva to a full-grown beetle takes nearly two years. The female lays her eggs about two inches deep in the earth, and the larvæ, after leaving the eggs, grow very slowly, live the whole winter in the earth, finding nourishment in the soil, and then become more developed, but remain as larvæ during the following summer and winter; then on the approach of spring they rise to the surface of the ground, where they accumulate. As many as ten bushels of the beetles have been collected from one acre of wheat. They fly from ear to ear and do not quit it until it is destroyed. They are capable of making long flights from one Government to another. Last summer a mass of these beetles was discovered in the sea near Ochakoff; they were so thick that it was difficult to pull a boat through them. They were gradually washed on shore, and the people, instead of taking prompt measures, allowed them to remain there. When at last they recognised the danger with which they were menaced, persons were sent with horses, casks, &c., to destroy them, but it was too late; about three-fourths had recovered strength and flown into the neighbourhood to form a new generation in

that district." The Vice-Consul adds, that unless efficient measures are adopted it is probable that all agricultural Russia will eventually become the prey of these insects, causing privations hitherto little known in the country. He considers that the subject demands the serious attention of Europe, as Russia supplies so many countries with wheat, and her misfortune may raise the price of American produce.

In his sixteenth Report on injurious insects (Journal of the Royal Agricultural Society of England, vol. xviii), Curtis says respecting the larvæ of the common *Anisoplia* (*Phyllopertha*) *horticola*, that they are often very destructive in pasture-land by consuming the roots of the grass, and that the best remedy is to water the grass in the autumn with a mixture of one-tenth of gas-liquor to nine-tenths of water, which will do no harm to the grass but will extirpate the larvæ. When gas-liquor cannot be obtained strong salt water may be used. In the spring, he says, land affected by these larvæ should be broken up, as at that time they are near the surface and become an acceptable treat to rooks, starlings, thrushes, blackbirds, robins, &c., and even sparrows have been known to gorge themselves with these larvæ so that they were unable to fly. The perfect beetles eat roses and flowers of hawthorn, and then feed on wheat and oats. But although generally common the insects are not excessively numerous every year, and so it may be with *A. austriaca* in Russia, and that the damage apprehended from it may be exaggerated. There is no fact relating to insects better known than that a species may be exceedingly abundant generally, in one year, and, contrary to expectation, be very scarce the next, or for several years afterwards.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: August 22nd, 1880.

P.S.—Since the foregoing was in type I am reminded that the ravages of *Anisoplia austriaca* in Russia formed the subject of a report by a Sub-Committee of the Entomological Society of London in 1878, which was drawn up for the use of Her Majesty's Consul at Taganrog, who, in a communication to the Foreign Office, had adverted to the immense damage done by these and other beetles to the grain crops in several provinces of Southern Russia. The report of the Sub-Committee (given at length in the Transactions of the Society for 1878 [Proceedings, p. 57], and noticed in this Magazine, vol. xv, p. 212), after alluding to the appearance of enormous numbers of *A. austriaca* in the Banate, Hungary, in 1867—upwards of six millions of beetles being estimated to have been then destroyed by 100 men employed for the purpose—goes on to recommend as remedial measures, the rotation of crops, and the preservation of insectivorous birds; and finally states that experience shows there is no reason to apprehend such a visitation every year.—J. W. D.

Notes on some scarce Coleoptera.—In the August number of this magazine, p. 69, *ante*, I recorded the capture of *Euplectus punctatus*, some years ago, in Sherwood Forest, by Mr. Matthews; on August 27th, I took this beetle myself under bark of a rotten tree in its old locality; I also got a specimen of *Micropeplus tesseraula*, by sweeping at sunset. I had always supposed this to be a fen insect, but must have been mistaken.

Among some beetles sent to me to name by Mr. T. N. Hart-Smith, of Marlborough College, I found a specimen of *Hydroporus marginatus*: this is, I think, a new locality, it seems to be found both near the coast and inland; it is probably often thrown away in mistake for *H. litura*, which it much resembles at first sight;

it is, however, easily distinguished by its larger and wider shape, its differently coloured head, and thorax widely margined with yellow.—W. W. FOWLER, Lincoln: October 15th, 1880.

Two additions to the Dragon-flies of Switzerland.—In August of this year I spent ten days in the Engadine, making Pontresina my head-quarters. Being specially in quest of *Trichoptera* my attention was principally directed to them, and I hope hereafter to publish a list of the species captured, with notes on the excursions, &c. In the course of my wanderings I came upon the little "Statzer-See" (scarcely more than a large pond) between Pontresina and St. Moritz by the wood-path over the side of the mountain, and lying at an elevation of about 6200 feet. It is fed by springs and very small streams, is uncontaminated by snow or glacier water, and it has a wide fringe of very boggy ground (as I found to my cost). So it is essentially fitted for alpine Dragon-flies and other *Neuroptera*. I soon found it was the haunt of species of the genus *Cordulia*, and on three days from August 12th to 16th, 13 examples of this genus were secured, which proved to consist of 9 ♂ of *C. metallica*, 1 ♂ of *C. alpestris*, and 2 ♂, 1 ♀ of *C. arctica*, the latter being new to the Swiss Fauna. Large *Æchna* were not uncommon, but it was almost impossible to capture them. Only three individuals were taken, viz:—*Æ. juncea* ♂ ♀ and *Æ. borealis* ♀, the latter also new to Switzerland. In June, 1865, I had taken *C. arctica* and *Æ. borealis* at Rannoch in Scotland, thus it was like the renewal of old acquaintanceship; but the surroundings were very different. The other Dragon-flies were not important, and the season was already advanced. The larger Lake of St. Moritz, although not a mile away, and into which the "Statzer-See" discharges, did not furnish a single Dragon-fly, a fact only to be explained by the very different physical conditions of the two lakes.—R. McLACHLAN, Lewisham: September 30th, 1880.

Chrysopa pallida in Switzerland.—Towards the end of August, I was a few days at Thusis, in the vicinity of the celebrated gorge known as the Via Mala. Five examples of the fine large *C. pallida* were secured by beating spruce firs, a species altogether new to this part of Europe. Others were seen, and it is probably rather common; but a series of small storms rendered beating chiefly productive of drenchings.—ID.

Extreme abundance of Cæcilius pedicularius.—Will you kindly tell me the name of the enclosed insects?

I take the liberty of applying to you because I suppose them to be *Psocida*. I know next to nothing of this family, and have not time to work it up, but I like to obtain an insight into any branch of Natural History that forces itself upon me. And this these little flies have done, for they abounded in my corn-fields and were a source of great annoyance to the harvesters by settling and crawling upon their arms and faces. Subsequently, on hot days, they have been on the wing in incredible numbers.

Am I right in supposing them to feed on fungoid growths?, if so, the mildew would account for their presence on the corn.—THOS. H. HART, Kingsnorth, Ashford, Kent: October 9th, 1880.

[The insects are *Cæcilius pedicularius*, L., the smallest European species of

winged *Psocida*, ordinarily very common in autumn, especially in houses. Mr. Hart is no doubt correct in supposing they feed upon mildew; probably they also attack ordinary dust and *débris*, such as that which collects in corners anywhere.—R. McLACHLAN.]

The red clover and hive bees.—"The bee has been forbidden the honey of the red clover, as a punishment for not keeping Sunday"—an interesting item of popular Natural History among the peasantry of Mecklenburg, which I find recorded in the recent work of Prof. C. Bartsch, "Sagen, &c., aus Mecklenburg."

This belief probably rests on the observed fact that the proboscis of the bee is too short to reach down to the honey of the red clover; nevertheless, they get at it by gnawing a hole through the side of the florets. (See Herman Müller, Befruchtung d. Blumen durch Insecten, 1873, p. 224).—C. K. OSTEN-SACKEN, Heidelberg: October, 1880.

A swarm of flies.—Under this heading the "Shipping and Mercantile Gazette," of September 8th, has the following account:—

"The Master of the schooner 'Topsy' informs us that at 10 a.m., on Thursday, the 2nd inst., while on a passage from Grimsby to London, the 'Topsy' became swarmed with flies, so thick were they that the people on board were unable to remain on deck for five hours; there were millions upon millions of flies. The air became clear about 4 p.m., when the flies were thrown overboard by shovels-full, and the remainder were washed off the decks by buckets of water and brooms."

I have seen the Master of the "Topsy" and he informs me that there is not the least exaggeration in this statement; and that although he has been in many parts of the world he never witnessed such a scene before. The vessel, at the time, was sailing along the Norfolk coast, about a cable's length from the shore; the air was obscured by the flies, as by a cloud, and they fell as thickly as snow-flakes, closely covering the rigging as well as the deck. He gave me some of the flies which I forwarded to Mr. R. H. Meade of Bradford, who has obligingly sent the following note respecting them:—

"The little flies are all females of *Dilophus vulgaris* (*spinatus*, Wlk.), one of the *Bibionida* (*Nemocera*). This common little fly ("in profusion everywhere, most so on sand-hills," Hal.*) sometimes appears in immense numbers or masses, in which the members of one sex usually greatly predominate over those of the other. Some of the species of *Biblio*, to which *Dilophus* is closely allied, have the same habit; very little is known of their life-history. The larvæ of the species of *Biblio* are said to feed at the roots of grass, and Zetterstedt says that he has found the larvæ and pupæ of *Dilophus vulgaris* in the stems of grass.

"The occurrence of this cloud of flies at sea is very curious and interesting. Were these females seeking some fresh pasture in which to deposit their eggs?"—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: September 15th, 1880.

Reviews.

THE TRANSACTIONS OF THE YORKSHIRE NATURALISTS' UNION: Parts i—iii. London: W. Satchell & Co.; Leeds: Taylor Bros. 1878—80, 8vo.

Most of our readers are familiar with the "Naturalist," the monthly journal of the above-mentioned "Union." Latterly the body has also issued a more pretentious publication in the form of "Transactions," three parts of which are before us.

* Wlk., Ins. Brit., Vol. iii, p. 140.

Naturally they include all branches of Natural History; but the subjects are divided into Sections, and each of these is paged separately. The aim appears to be twofold in its nature: firstly, to furnish local lists, and, secondly, to chronicle notable additions of novelties and rarities noticed in each year. Insects evidently occupy a large share of the attention of the Members of these Societies, and amongst the contributors we notice the names of Porritt and Prest for *Lepidoptera*, Mosley for *Hemiptera* and *Diptera*, and W. D. Roebuck and Bairstow for *Hymenoptera*. But Ornithology, Conchology, and Botany are equally as well represented. The paper, typography, and general "getting-up" are excellent.

The existence of such a multitude of Natural History Societies in a small district (for so Yorkshire is, notwithstanding it is our largest county), is probably an almost unique fact, and we believe we are correct in stating that the majority of the Members are of the artisan class. Judging from the List of Members on the cover of Part iii, half-a-crown is the usual annual subscription, but it appears to be optional with Members to supply pecuniary aid in excess of this modest sum, an option largely exercised, even to the extent of two guineas. Those amongst "Britishers" who know the tastes of some of the better class amongst our artisans in the great industrial centres (of which Yorkshire is one), will be little surprised at finding Naturalists so abundant amongst them: to foreigners the fact must be a matter for some little astonishment. It was a happy idea to unite these Societies under a central governing body, and this latter, if wise, should use its position for educational purposes on broad principles, by impressing upon the Members the necessity of recognising the fact that Yorkshire is not Britain, and that Britain is only an island in the northern seas.

INSECT VARIETY: ITS PROPAGATION AND DISTRIBUTION, TREATING OF THE ODOURS, DANCES, COLOURS, AND MUSIC IN ALL GRASSHOPPERS, CICADÆ, AND MOTHS; BEETLES, LEAF-INSECTS, BEES, AND BUTTERFLIES; BUGS, FLIES, AND EPHEMERÆ; AND EXHIBITING THE BEARING OF THE SCIENCE OF ENTOMOLOGY ON GEOLOGY. By A. H. SWINTON. London: Cassell, Petter, Galpin & Co., 1880, pp. 326, 8vo.

This work indicates extensive reading of the writings, in many languages, of authors, ancient and modern, who have investigated the attributes of insect-life, and copious extracts and references are given, together with statements of the researches and observations of the author himself, some of which have appeared in this magazine; the illustrations consist of a frontispiece, seven mostly well-drawn plates, and figures incorporated with the text. The odours, dances, colours, and music (erroneously so-called) of insects have always been deemed to be manifestations of love, fear, anger, or rivalry, and as ministering directly or indirectly to the maintenance of their race; but when it is said or inferred that they are also the primary or remote causes of insect-variety, we demur, and say that the statement or inference is not proved. It is admitted, even by the author, that sounds emitted by an insect are attractive only to others of the same species, although there are, as stated, some exceptions in the *Cicadæ*. Variety, that is, differentiation of species, and even the variation of the individuals of a species, are really due to extrinsic changing, or for a time persistent, conditions and agencies acting on elastic vital powers. Nevertheless, as bringing a great number of observations of numerous investigators into one view, this work is very interesting and serviceable, but it sadly wants an index for reference to special items.

The use of the vulgar English names of insects (and the book is full of them), at any rate without the scientific ones, is a mistake; such names, given in the old time by mere collectors, served *their* purpose of distinguishing the insects they obtained, so far as their own collections were concerned, but had no basis of scientific arrangement. They are, therefore, of no service now, either with or without the scientific names, and although attempts have been made to retain them by some who should have known better, they are deservedly falling into disuse. If our author hopes to have his book read out of Britain, what can a foreigner understand by "Bath White," "Queen of Spain," "Dark Arches," "Tawny-barred Angle," &c.

The literary composition is very curious. Thus, we find such terms as "symbol of war," "brown horror of autumn," "ambient ether," "sun-god," "domain of Flora," &c.—all inappropriate in a work of scientific character. The style of the writing is ambitious, but the long, involved sentences, despite the surplus of sensational adjectives, are often obscure, to say the least. Thus, at page 60, we read, "We have shown that the *battle* of males for the female, that burns so fiercely in higher organizations, which gave antlers to the stag, horns to the bull, spurs to the cock, and incisive weapons to the fish, smoulders yet more intensely in mandibulate insects of the *Orthoptera*, *Coleoptera*, *Hymenoptera*, and *Neuroptera*, many of whom bite and devour one another." At page 86,— "If we consult a cabinet as regards terrestrial climate, we shall find that the rays of the sun impart a richness of tint, varying with the ardour of his beams, and that tropical species, which are diurnal, have a gaudiness compatible with the languor of a clime that becomes their guardian, expressed in the opaque, paint-like pigment that imparts a varnish to their dermal tints, with a heaviness to their external coverings." Other similar *delicæ* await the reader—these he must find for himself; the climax of rhapsody is, perhaps, reached at page 169, thus:—"In the existing rage for cheap music, when flashing lights, impassioned notes, and sweet warblings greet the man of business homeward wending, and drive far into the sorrows of the night, it is scarcely to be wondered, refrains so full of small peaceful harmonies as those complaining notes (of grasshoppers), that each autumn echo beneath the blithe ring of the mowers, should continue a study for the poet and musician. And it is thus we not only hear of them blending in the luxuriant tide of song on Transatlantic pianos, but what is more generally feasible, find them adapted to rhythmic notations by admiring frequenters of the green banks of the Rhine and Alpine glaciers, where they possibly lend much to the charms of the scenery. * * * Nor are the pastorals of our insular troubadours to be despised. How often do the young in years, who listlessly recline in zephyry hay-fields, take lovers' walks or meditative strolls, receive brisk overtures, which haunt the mind and whisper back the cheerful voices of seasons that have flown!"

On the other hand, we have expressions of wonderful *naïveté*. Thus, at page 39, we read:—"An example of the Privet Hawk Moth I had killed in the usual manner, and had assumed to be dead;" and, at page 295: "In the large voracious Wart Biter, a parrot-like transition (of colour) after emergence serves to develop an invisible pattern of brown spots, which renders the individuals to human optics considerably more conspicuous and suited to recognise and reproduce their kind."

The printing is clear, but there are several typographical errors, such as "accept" for "except," "blue-fly" for "blow-fly," "*Leucanida*" for "*Lucanida*," &c. Often names of insects are in Roman instead of Italic type; and such eccentricities occur as, for instance, "*aphrodite*" with a small initial letter, and "*Brassica*" with a large one; for all which blemishes we trust some one besides the author is accountable.

EUCALYPTUS GALLS.

BY R. McLACHLAN, F.R.S., &c.

I am indebted to Dr. M. T. Masters, F.R.S., editor of the Gardeners' Chronicle, for the opportunity of describing and figuring two most remarkable forms of Galls on *Eucalypti* from Australia.

The singular mass of galls, of which a *slightly enlarged* figure is given below, was sent from the Phytologic Museum of Melbourne,



Australia, to Dr. Masters, by Baron Ferdinand von Mueller. These galls were found by Mr. Tepper on *Eucalyptus gracilis* at Spencer's Gulf, South Australia. The branched twig before me (only a portion of which is figured) bears several hundred galls, thickly clustered, and

their position is such as to induce a belief that each gall is a modified flower-bud. In a dried state the galls are reddish-grey in colour. They are of a long spindle-shape, slightly curved, with the apex much produced, the outer surface slightly rugose, and with faint longitudinal ribs. The length of the individual galls varies from 6 to 13 lines, and the average diameter is about $1\frac{1}{2}$ line. When broken they are seen to be quite hollow, with only thin walls, and they emit a pleasant



aromatic resinous odour, similar to that of rosemary. Many of them have a small circular opening (see the enlarged figures) a considerable distance below the apex, whence an insect has escaped.

I have broken open many galls from which an insect had not escaped. In some of these I find the shrivelled-up remains of a larva (never more than one in a gall) that appears to be dipterous, and no doubt the true gall-maker, but in the majority there is the dried-up pupa of a Hymenopterous parasite with clavate antennæ, apparently belonging to the group *Pteromalini* of the *Chalcididæ*. In all those galls from which the insect has emerged, I find only the puparium of this parasite. I have not sacrificed every unperforated gall, but those

examined have not presented Dipterous pupæ, nor the remains of any Dipterous insect ready to emerge. We are thus left somewhat in the dark as to the real nature of the gall-maker, and it is very desirable that specimens of the galls in alcohol be examined.

The second figure (p. 146) represents galls on a species of *Eucalyptus* also forwarded by Baron Ferdinand von Mueller, *much reduced in size*. At first sight each gall reminds one of a distorted fruit or capsule, but Dr. Masters is of opinion that (from their position) they are not modified buds either of leaf or flower. On the twig before me the galls are placed unilaterally, with the exception of the lowest of the series. Each gall (dried) is somewhat olivaceous in colour (as the leaves). Each measures about 10 lines in length, and about 5 in diameter. Each has four strong angular keels externally, which are continued into extraordinary processes about $2\frac{1}{2}$ inches long, and slightly curved at the tips; occasionally one of these processes is aborted or abbreviated, and in one instance a tendency to furcate is shown. They are extremely hard, and the walls are quite a line in thickness, and when cut, a very strong odour, like that of intensified black currant, is very evident.

Fortunately in this instance it is possible to fix with certainty the Order to which the gall-maker belongs. Baron von Mueller extracted larvæ from some similar galls, and forwarded them in fluid. They are Lepidopterous. A well-grown larva is about an inch in length, pinky-whitish in colour, somewhat semi-transparent,



$\frac{1}{4}$ and without markings, save that there are black dots on the spiracular region, independent of the black spiracles themselves; the head is pale castaneous. There are eight ventral (in addition to the anal) prolegs. Judging from the general aspect of the larvæ I am inclined to refer them to the *Pyralidæ*, but their exact position must remain doubtful. In those galls opened by me I find the interior entirely occupied by what appears to be an imperfectly developed chrysalis of the moth, covered with a whitish powdery substance, and greatly distended. Each chrysalis is crammed with the fully developed pupæ of a Hymenopterous parasite of the family *Chalcididæ*. In no case is there any orifice through which a moth could have escaped, but in the middle of the apex, between the four horns, there is a very small opening, scarcely sufficient to admit a small pin, which I take to be natural, and serving to supply air, which it would be impossible to obtain through the thick hard walls of the galls, and not made by the parasites, though it might afterwards be enlarged to admit of the escape of either moth or parasite. The tail-end of the chrysalis is extremely pointed, and placed towards this minute orifice.

Lewisham, London : November, 1880.

EREBIA CASSIOPE AT HOME.

BY JANE FRASER.

Of the four localities in Perthshire where I have met with *Erebia Cassiope*, three are on the northern slope of mountains, and thus peculiarly exposed to cold wind. During last summer (1880) I observed *Cassiope* on the wing for the first time on June 16th, the day was bright and sunny, with a strong wind from the east, only a very few of the insects (all males) were to be seen, and all had that velvety appearance which betokens recent emergence. On June 25th, it was out in great abundance, and on July 1st, still appeared in large numbers, and though some of them were worn and tattered, many of both sexes appeared to be freshly out.

Among the Perthshire hills there is one, which, though only between 2000 and 3000 feet high, is rather famous as a place where strangers not well up in the geography of the surroundings, are apt to lose their way, and have been known to wander as far as a shepherd's hut in a neighbouring glen, several miles in an opposite direction from the glen they started from in the morning. It is certainly one of the wildest, rockiest bits of hill ground in Perthshire, at the base pretty well wooded with birch, fir, hazel, and alder, and there is one secluded spot where, underneath the hazels, the rare *Scopula decrepitalis* has its home. From half-way up the mountain to the summit there are innumerable high ridges of rock, and between these ridges there are rills of clear sparkling water foaming and tumbling over rocks and stones, sometimes forming still pools which reflect the heather-clad banks, and here and there huge masses of rock are lying, which must in times gone by have rolled down from the mountain top, but now are overgrown with heather, blaeberry, and crowberry. These huge detached masses form favourite resting places for the Peregrine Falcon, and more than once I have got a glimpse of this grand-looking bird perched in such spots, and as traces of the fur of the mountain hare and feathers and bones of birds may be observed sometimes on the tops of those rocks, it would seem to be a habit of the Peregrine to convey his food there.

On July 1st, we ascended this hill from the north, its steepest and most rocky side. The morning had been cold and misty, but the clouds gradually "lifted," and at last the sun sent forth a blaze of heat, and immense numbers of insects appeared on the wing. From the sheltered side of nearly every rock *Larentia cæsiata* rose in crowds at our approach, some of them with the dark bar on the fore-wing very black and strongly marked, and, wherever there was a bit of

level peat bog, *Ctenonympha Davus* was to be seen, its tawny wings harmonizing with the quiet tone of the surroundings. At an elevation of about 1000 feet, on either side of a picturesque burn which was shut in on both sides by rocky banks, we found *Erebia Cassiope*, at first sparingly, but as we advanced a little higher it increased in numbers, and at 2000 feet was abundant. It was seen in greatest numbers in the ravines formed by those small mountain rills where tufty grass grew, but was to be seen also flying over, alighting on, and at rest (when out of the sun) on the heather. During the afternoon and while the sun was bright they were very active on the wing, and sometimes took pretty long flights, but always flew low, seldom rising more than four feet above the ground, and when a slight passing cloud overcast the sun for a few minutes, they did as *Erebia Blandina* so often does under the same conditions—dropped in among the grass and lay with folded wings close to the roots, looking like old withered leaves. There was one sheltered place beside a small waterfall where mountain thyme and a little yellow starlike flower grew in abundance, and it was charming to see them resting on the flowers with expanded wings, the dark red spots looking brighter in the sunshine than they do in the cabinet. At a height of about 1000 feet *Larentia cæsiata* ceased to appear, and was succeeded by *Mixodia Schulziana*, *Scopula alpinalis*, *Amphisa Gerningana*, and *Tortrix viburnana*, all these on this hill ascending to 2000 ft. A little above this altitude the dense cloud which had overshadowed us in the morning, still shrouded the hill top, and rendered the air too chill and damp for butterflies and moths. And a strange experience it was to be so near this thick mist; while standing in the sunshine about 100 feet below it, the distance so clear that the blue peaks of far-away Jura and Mull were visible. An occasional drift of chill misty air blowing past, warned us that it was unwise to remain so near the cloud, and getting over the shoulder of the mountain we began to descend the southern slope, keeping in the gorge of a water course. A little below 2000 feet *Erebia Cassiope* again appeared, in some sheltered spots, literally swarming, and altogether in fresher condition than those on the north side of the mountain.

It was pretty early when we started in the morning, but I was so charmed with the sight of this pretty Alpine butterfly, that I lingered among them until the sun went down behind a higher mountain, and then the *Cassiope* betook themselves to their night's quarters. A very few simply closed their wings, and hung like little withered leaves from grasses, but the majority dropped in among the heather and clung to the stems a little above the ground with their wings drooping downwards.

18, Moray Place, Edinburgh :

October 15th, 1880.

AN ADDITIONAL SPECIES OF BRITISH *HEMIPTERA*.

BY JAMES EDWARDS.

On the 18th October last, I took off a spruce-fir at Stratton Strawless, near Norwich, a few examples of a *Lygus*, which Mr. Douglas has determined to be a species not hitherto recorded as British. The characters given below will suffice to distinguish it from all the British species of the genus; it comes next to *L. rubricatus*, Fall.

LYGUS ATOMARIUS.

Capsus atomarius, Meyer, Schw. Rhynch., 73, 46, tab. 4, fig. 3 (1843).

Hadrodema atomaria, Fieb., Eur. Hem., 277, 1 (1861).

Lygus atomarius, id., 392, 3.*

Long-oval. Above testaceous, more or less tinged with red, closely punctured, and covered with fine pale pubescence; sometimes more or less irrorated with black, or with a black stripe on each elytron.† *Head* in ♂ black, in ♀ pale with three black spots, the middle one V-shaped; *cuneus* orange, the inner angle with a small black spot; *membrane* irrorated. *Scutellum* generally with a dark central stripe. Intermediate and posterior *thighs* with two dark ante-apical rings; posterior *tibiae* outwardly with fine, short, black spines; last joint of the *tarsi* black, except at the base. *Antennae* dingy yellowish, the 3rd and 4th joints, and more or less of the apical portion of the 2nd, black. Length, 2—2½ lines.

The variations in marking seem to be confined to the males.

Bracondale, Norwich:

5th November, 1880.

ON THE EGGS AND LARVÆ OF SOME *CHRYSOMELÆ* AND OTHER (ALLIED) SPECIES OF *PHYTOPHAGA*.

BY J. A. OSBORNE, M.D.

In the synthetic arrangement of larvæ attempted by McLeay and extended by Kirby and Spence, the Coleopterous larvæ are divided into five tribes by McLeay, one of which is—

"4. *A hexapod and distinctly antenniferous larva, with a sub-ovate rather conical body, of which the second segment is longer and of a different form from the others, so as to give the appearance of a thorax.*

* Fieber gives as a synonym *Capsus delicatus*, Mulsant (recte Perria), Ann. Soc. Linn. Lyon, 1857, p. 167, but the description in no way accords with *L. atomarius*, and Reuter refers the species, as distinct, to the genus *Amblytylus* (Hem. Gymn. Eur. ii, 210).—Eds.

† Meyer's description and figure, made from a single example, show the pronotum and elytra covered with scattered pitchy-black atoms. Fieber, however, remarks that a fully-spotted individual is represented, that such marking is exceptional, and even on the membrane is sometimes obsolete. Frey-Gessner (Mitth. schw. ent. Ges., ii, 23) says also that Meyer's type-form rarely occurs, and he had ample means of knowing, for he adds that in Switzerland, although the species is scarce, yet at times, in the place where it is found, it is numerous on "Rothtannen" (*Abies picea*) in April and September. It is also found in Bohemia and France on other conifers.—Eds.

His denomination for these is *Anopluriform*, from *Pediculus*, L., forming Dr. Leach's *Anoplura*. His examples are *Coccinella* and *Chrysomela*, L." K. & S., vol. iii, p. 160.

The general description may apply; but that striking, if superficial, resemblance to *Pediculus*, which suggested the denomination, does not extend to all the species included in the Linnean, nor perhaps to any of the restricted, genus, *Chrysomela*. In giving their own definition of the Anopluriform type (*loc. cit.* p. 162), K. & S. exclude *Chrysomela* altogether in restricting its application to *carnivorous* larvæ; but, leaving out this word, the rest of the description—"hexapod; antenniferous; with a shortish oblong depressed body, and distinct thoracic shield,"—seems to apply very well to a section of the Linnean genus, *e. g.*, *Lina*, *Gastrophysa*, *Prasocuris*; and to be equally unsuitable to others, as *Timarcha* and *Chrysomela*. At p. 156, K. & S. speak of some larvæ as being "gibbous above, and flat underneath; as those of *Chrysomela*," &c. To this section the term *Heliciform* might perhaps be applied; at least, the superficial resemblance is as striking as in the case of the other section and *Pediculus*. In the case of some larvæ feeding on water-mint, which I found in July, 1877, and which subsequently yielded beetles of *Chrysomela varians*, I find the following description in my note book: "One of the largest is 2—2½ lines long, and at the highest point of abdomen 1½ line high. It is laterally compressed. The head and prothorax are darker than the rest, and project from the dull-coloured body, which might be described as two-thirds or three-fourths of an oblate spheroid standing upon its truncated part. The insect does not extend itself much in walking, and, when alarmed, draws itself in, tail towards head, when it is well fitted for rolling, and lets go. It is not anopluriform. The head is black, flattened in front, and slightly bilobate; porrected in travelling. The antennæ are conical, pretty long for a larva, banded alternately, light and dark, and are retractile within the head. . . The prothorax is black also above, somewhat semicircular or rounded posteriorly where it overlaps the second segment. Here the colour changes to the dull greenish-drab of the rest of the body. The legs are pretty long, jointed, and furnished with single claws. The spiracles are a row of seven or eight black dots on either side, with a minute white (or clear) eye in the centre of each. . . A faint line runs somewhat archwise between each pair of spiracles, and from the angular apex of this line, which is nearer to the spiracle in front, a similar faint line runs up the side for a short distance, then forks, and the two branches, crossing the back, intersect with similar branches from the adjacent lateral

transverse lines, and are so continued on to the other side, thus forming along the back a series of transversely elongated lozenges, touching one another at their obtuse angles. The larva feeding looks very like a depressed *Helix* (shell) with the mollusc out and crawling." Very similar to these are the larvæ of *Chr. polita* and *Banksi*, both of which I have reared from the egg to the imago; and *fastuosa* has the same essential characters, at least as far as I was able to trace them, which was up to the completion of the first moult.* These four species feed on labiate plants: *polita* and *varians* on *Mentha*, *Banksi* on *Stachys*, and *fastuosa* on *Lamium*. Stephens placed the latter beetle in his sub-genus *Gastrophysa*, Chevrolat along with *raphani* and *polygoni*, living on plants of a different natural order—*Polygonaceæ*. The points in which *fastuosa* agrees with *polita* and *Banksi*, and differs from *G. raphani*, may be stated as follows: the glutinous matter accompanying the eggs, and which, according to Von Siebold, is the disintegrated portion of the *tunica propria* which accompanies them into the oviduct, is very abundant in *Gastrophysa*, dries up very slowly, and remains always more or less sticky. In *Chrysomela* it is scanty and dries up quickly into a brittle substance, so that the eggs, when in clusters, are readily broken asunder and scattered about like ripe seeds. The eggs in hatching, open in both cases, by a longitudinal slit over the dorsum of the larva; but, in *Gastrophysa*, the empty shell remains gaping, and tends to collapse, whilst in *Chrysomela*, the slit closes so accurately and the shell retains its original shape so completely, that it is often difficult to tell whether the larva has escaped. I have seen a young larva of *Banksi* that had come out of the egg tail first, caught by the neck in the elastic shell, which it dragged after it but could not escape from, like a mouse in a trap. In *Chrysomela* the eye-spots are six, in two rows of three each, on each side of the head. In *Gastrophysa* the external spot of the posterior row is wanting. Very conspicuous on the meso- and meta-thorax of the *Gastrophysa* embryo within the shell are four large black spots in the form of a square. In *Chrysomela* the equivalent spots are six in number, the additional pair being on the first abdominal segment; and they diminish in size from before backwards.

The larva of *Gastrophysa* is tuberculate, and agrees generally, especially in the points which I have italicised, with the description of the larva of *Chr. (Lina) populi*, as given by Westwood (Modern Classification, vol. i, p. 388)—"This larva (fig. 48, 9, &c.) is of an

* I have also found a larva of this type feeding on oat leaves. It was probably *Chr. graminis*, but I did not succeed in rearing it.—J. A. O.

oblong-ovate form, of a dirty greenish-white colour, *with numerous black scaly spots; its meso- and metathoracic segments are furnished with two large lateral, conical tubercles, and the abdominal segments have also two rows of smaller dorsal and lateral tubercles, from which . . . drops of a fetid fluid are emitted when the larva is alarmed.*" The *Chrysomela* larva, on the other hand, has the same general resemblance to that of *Timarcha*, as figured by Westwood (*op. cit.*, p. 389, fig. 48, 2). The larva of *Gastrophysa* moults twice before pupation, retaining the same larval form. *Chrysomela* moults three times: before the first moult the young larva is hirsute, but afterwards nearly smooth, without hairs, or with only a very fine pubescence, and without warts or tubercles. The *Gastrophysa* larva is always depressed and extended: that of *Chrysomela* laterally compressed, with the manitrunk and abdomen humped—rising from the darker scaly head and prothorax in the manner of the shell from the snail in crawling. Before the first moult the larva, with its arched hairy back and conical ear-like antennæ, is often ridiculously like a young kitten. In all these points—character of shell,* number and arrangement of eye-spots, and dorsal warts, number of moults and general anopluriform appearance—the larva of *Prasocuris marginella* agrees with *Gastrophysa* and differs from *Chrysomela*.

One other point of interest remains to be mentioned, a point of agreement between *Gastrophysa raphani* and *Lina populi*. At pp. 242—3 of vol. ii, Kirby and Spence, speaking of *osmateria*, say: "The grub of the poplar beetle (*Chrysomela populi*) also is remarkable for similar organs. On each side of the nine intermediate dorsal segments of its body is a pair of black, elevated, conical tubercles, of a hard substance; from all of these, when touched, the animal emits a drop of a white milky fluid, the smell of which, De Geer observes, is almost insupportable, being inexpressibly strong and penetrating. These drops proceed at the same instant from all the eighteen scent-organs; which forms a curious spectacle. *The insect, however, does not waste this precious fluid; each drop instead of falling, after appearing for a moment and dispensing its perfume, is withdrawn again within its receptacle, till the pressure is repeated, when it reappears.*" See also plate xviii, fig. 1. I wish to call attention to the sentence I have underlined, for a reason which will be immediately apparent. I wish, in fact, to ask: is it quite certain that this emitted matter is entirely

* The nature and amount of the glutinous matter is not obvious in the case of *Prasocuris* eggs. The insect cuts a small round hole in the hollow petiole of a *Ranunculus* leaf and deposits the eggs, to the number of 4 or 5—7 in the interior. —J. A. O.

and only a fluid—a secretion—and not rather a portion of the substance of the animal itself? The larvæ of *G. raphani* are furnished with similar latero-dorsal tubercles, of which the four on the meso- and metathorax are the largest. On the upper surface of these a minute puckered pore may be observed. But, although I have been breeding these larvæ for years, it is only recently and accidentally I have discovered that under peculiar circumstances (circumstances, however, reproducible at pleasure) the larva emits from these tubercles a double row of clear liquid-like (stalked ? and) capitate protrusions, which, coming and going simultaneously, instantly brought to mind the figure in K. & S. on plate xviii. The conditions requisite for evoking this phenomenon in the case of *G. raphani*, are exposure to strong sunshine in a close moist atmosphere. The larvæ may then be observed as with a row of glass bead-headed pins stuck in on either side. But, at the least disturbance, these instantly disappear, so that I could not touch them to see whether they were fluid or not. They do not seem to be accompanied with any smell. It was only afterwards, under different circumstances, I was able to arrive, with tolerable certainty, at the conclusion that these bead-like processes from the *Gastrophysa* larva are not a liquid secretion, but an everted portion of the insect itself, rather comparable to the horns of certain caterpillars.

In what I call a *double* batch of between 80 and 90 eggs laid (August 26th) by a ♀ which, having been originally kept as a virgin, and which in that state laid some parthenogenetic eggs, was afterwards allowed to become impregnated, but became so only to an imperfect extent,—in this batch, along with some perfectly healthy larvæ, I found many that perished in the hatching, and among these several in which these protrusions from the four thoracic tubercles were very striking. They were quite analogous to those observed in the older larvæ, and were emitted from the same parts, viz., the pores of the latero-dorsal tubercles of the thorax, the only part out of the shell; and as they were no longer spherical, but elongate finger-shaped, and as they persisted for many hours—in fact, were never withdrawn, during which time they exhibited lateral twitching movements, I could not doubt their non-fluid nature. And this has suggested to me, that in the case of *Lina populi* also, the main portion of the extrusion underlying the milky, opaque, odorous fluid, may be an analogous solid portion of the animal itself.

Milford, Co. Donegal :

October, 1880.

THE LIFE-HISTORY OF *GRAPHOLITHA NIGRICANA*.

BY JOHN H. WOOD, M.B.

The occurrence of this insect in England has been already recorded in this Magazine (Vol. xiv, p. 241) from a single specimen taken here in the summer of 1875 or 76. As, however, it had been repeatedly looked for since without success, I was beginning to fear it was an accidental introduction that had failed to established itself, when, on July 17th, 1879, I beat a specimen in fine order out of a group of silver-fir (*Abies picea*). Two days later I found the little moths flying in the early afternoon round these same fir trees. They flew rather high, but gusts of wind occasionally brought them within reach of the net, and I secured nearly twenty specimens, and then desisted from fear of working the species too hard. At the end of the month though much occupied with other matters, I made an effort to visit the locality once more, with the hope of getting, if possible, a gravid female. On this occasion no moths were to be seen flying round the trees, but I beat out of the lower branches two worn individuals. These were placed in a bottle with a sprig of *picea*: one of them died very shortly, but the other lived a week, and laid seven or eight ova. These, with the exception of one or two that were laid on the cork of the bottle, were deposited singly on the needles. They were large, round, full, and very conspicuous for the ova of so small a moth, of a dirty-white colour, which afterwards became reddish, this change, being seen under a lens, to be due to the development of an irregular band of that colour round the base. Early in September, the larvæ appeared—little yellow fellows with black heads. They were placed on fresh sprigs of the silken fir, but nothing more was seen of them, nor could any trace of their workings be afterwards found in leaf or bud, though carefully looked for. Still, I had little doubt from the evident liking the moths had for this fir, that it was the proper food, and that there would probably be little difficulty when spring came round of again taking the matter up. On the 15th of February, the attempt was made, and successfully. I found the larvæ feeding in the buds, indicating their whereabouts by the covering of silk spun over the spot at which they had entered. The terminal buds of the side shoots were those chiefly attacked. These are usually arranged in sets of three, and the larvæ eat them out one after the other, converting them into a common cavity. At this date the larvæ was still very small, brown, and with black head and plates. Towards the middle of April they became full-fed, when they came out of the buds

and affixed their cocoons, which were made of *débris*, and were rather fragile, either to the outside of the buds or in the angles of the shoots. Five moths emerged. The full-grown larva is soft, fat, and shining, of a dirty-yellow colour, with just the suspicion of a greenish tinge in it on the thoracic segments. Head small, and deep black, as is also the plate on 2nd segment.

I may add that the silver fir grows remarkably well in Herefordshire, and often reaches a large size, but the group of trees that supplies *nigricana* is only of some twenty or thirty years' growth. It is not a fir that seems much liable to the attacks of insects; its stiff, thick needles are seldom seen marked by their mandibles, and with the exception of the above, and the larva of *C. distinctana* that lives in the needles, no other Lepidopterous larva appears to feed upon it in this neighbourhood.

Tarrington, Ledbury:
11th October, 1880.

FURTHER NOTES ON THE NATURAL HISTORY OF *BOTYS*
PANDALIS.

BY WILLIAM BUCKLER.

That I am able this year to offer a few more observations on the larva of *pandalis*, as a supplement to those at p. 28, *ante*, is owing to the great kindness of Mr. W. B. Fletcher, who sent me on May 27th, a batch of eggs laid by a female he had beaten out from a tangled growth of rose and bramble in the New Forest.

These eggs were laid in a chip box, in five separate flat patches, containing from ten and upwards to twenty in each, as near as they could be counted with aid of a strong lens, which also showed them to be somewhat overlapping one another, yet withal showing so smooth a surface as to look like a deposit of yellow grease upon the chip.

Four days after I had received these eggs, there appeared on many of them two most minute dusky specks, and after two more days strong bluish-black marks (doubtless the ocelli, mandibles, head, &c., so accurately observed by Mr. Jeffrey). Every day produced these appearances on more of the eggs in succession, while from the most forward at intervals the larvæ were hatching by night, when on 8th of June, the remainder were fatally arrested by a sudden fall in the temperature.

On the 2nd of June, the first four young larvæ were as an experiment placed with leaves of rose and bramble; the next four

with leaves of *Teucrium scorodonia*; after a day or two I found the former had gnawed a little of the cuticle from the softest of the bramble leaves only, thus causing their white bodies to be very faintly tinged with greenish, while the latter had made holes quite through the leaves of *Teucrium*, and evidently liked their food so much better, that afterwards I kept all the larvæ entirely on *Teucrium*, and they thrived on it remarkably well; but this food certainly seemed to influence their colouring, as they were all very much paler than the brood of last year, fed chiefly on other labiate plants.

The larvæ had constructed their first cases by 25th of June, and I noticed some of these, as well as one or two of a later period, varying from the usual pasty-shape, and having a more fusiform outline; and for some time leaves of their food-plant furnished the materials, until by accident a piece of honeysuckle got introduced, and a case was cut from it; after that I made trial of other leaves, until the preference seemed given to those of *Rubus corylifolius*, from which latterly all the cases were fabricated.

Early in July I established the larvæ in a large glass vessel holding plenty of *Teucrium* sprays standing upright, secured at the top with stout unbleached calico, an arrangement allowing me to watch, without disturbing the shy little creatures; and I soon found their habit was to remain constantly hidden in the case, whether lying on the surface of a leaf, or hanging, as they would for hours, suspended from a leaf or a stem by a dirty-coloured thread half an inch or less in length; and even when desirous of feeding they put forth their anterior segments only, for the purpose of reaching the part of the leaf they meant to attack, and then immediately, with a little jerk, pulled forward the case over the segments they had exposed in moving, and fed away as it were by stealth.

Occasionally one could be seen attempting the difficult task of ascending the glass from the bottom, and of course often failing to secure a footing on the slippery surface; but during these efforts, made with half its body exposed and stretched to the utmost extent, if it chanced to touch any part of the food plant for a foot-hold, the case would be quickly drawn up over it, a performance which reminded me vividly of an old acquaintance—the aquatic *nymphæalis*;—but while thus engaged it would at the least alarm shoot back in an instant within the case, often causing it to fall lightly to the bottom, and there, lying perfectly still, it had the natural appearance of a mere fragment of leaf rubbish.

The colouring of these larvæ was light pinkish-drab above, and much paler beneath, the darker dorsal line invariably noticeable *between two pale lines* (a detail inadvertently omitted in my previous description), the tubercular shining spots though blackish on the thoracic segments were on the others of a warm lightish brown: when full-fed and almost ready to spin up, the length was about an inch, and the colouring changed to a very pale yellowish flesh tint except just at each end of the body.

When all but one were spun up in their cases, and I wished to examine that one in mature condition, I tried to push it out of its case with a piece of string, but though this passed through from end to end it failed to expel the larva, whereupon I stripped it of the case piecemeal, and kept it unclothed until I had figured it; then I supplied it with various leaves, but it refused to utilize any of them for a new case, and eventually took up a new position on the stout calico top of its prison; twice I removed it and put it first on a leaf of bramble, and then on one of beech, but it would persist even a third time in returning at night to the same spot as though it had lost reliance on any leaf, and there it expended five days of hard labour in cutting through and fashioning the tough material into a pasty-shaped case, which it moored to a few leaflets of its food plant, and spun up on the last day of August.

On October 22nd, I luckily bethought myself of the three perfect insects of last year's brood that emerged in autumn, and at once inspected the pot of this season's pupæ and found two perfect specimens, male and female, quietly sitting on the leno cover; this, without disturbing the moths, I removed to a fresh pot, and on the 24th, found presumptive evidence of their having paired, in a patch of the deep yellow eggs laid on the white surface near the bottom.

Whether in our climate the imago would emerge at this time of the year when under natural conditions I should think is very doubtful; in a warmer climate it seems to be regularly double-brooded, for Guenée says it flies "en mai, puis juillet et août;" perhaps therefore in hot summers a second flight of moths might occur in August with us, but hitherto only one flight has been recorded, the date of which Wood,* Humphreys and Westwood, and Stainton agree in giving as (the beginning of) "June."

Emsworth: November 5th, 1880.

* 815 *Angustalis* } Wood, "Beginning of June."
 816 *Terminalis* }
 H. and W., "About the beginning of June."
 St., "VI."

ON THE DISTRIBUTION OF *DAMASTER*, WITH DESCRIPTION OF A NEW SPECIES.

BY GEORGE LEWIS.

For the study of certain forms of *Coleoptera* which are limited in their distribution, the fauna of Japan is convenient, inasmuch as the country covers over fourteen degrees of latitude, and the greatest breadth of unbroken land is barely five degrees in the widest part. The Archipelago is cut up into sections by dividing seas and straits: in the north by the Tsugar Strait, in the south by the incursions of the inland sea, while the main island in latitude 35° is geographically much broken up by the Owari Bay, Biwa Lake, and Wakasa Bay, and over this last line many of the southern species do not pass. Let us consider the position which *Damaster*—an endemic form of *Carabus*—takes in a country thus topographically divided, and see how changes of climate modify varieties and create species. In Kushiu, the southern part, we find a large black species of nocturnal habits measuring 29 lines; a species of such vigorous and substantial habit that we almost instinctively look on it as the father of every *Damaster*. The forests it inhabits are those with summers of sub-tropical heat and length, ushered in by heavy rains, with little thermal change day or night. The trees there attain considerable height and girth, and through many groves the sun scarcely penetrates. A few miles northward of this district, near the well-known volcano of Simabara—the summit of which is sometimes in mid-winter capped with snow—the valleys are composed of decaying lava, and on such a soil the trees are of more moderate growth, and easily penetrated by the cold winds of the higher altitudes. Here, although only a few miles from Nagasaki, are great climatic changes, and we find *D. Lewisi*, a half-starved form, so to speak, of *D. blaptoides*. We then pass considerably more to the eastward, but only $1\frac{1}{2}$ degrees north, to Hiogo. Again we find the soil, climate, and vegetation correspond with Simabara, and the same species of *Damaster*. Crossing the Biwa-lake-barrier into the Yokohama district we come to quite a different form of insect, and we need not look far for reasons of change: we find *D. pandurus*, a clumsily-formed species, in which much of the elegance of the outline in the genus is lost, and the elytral mucrones almost obsolete, and with these changes colour first appears. The winters of Yokohama are comparatively severe: snow not infrequent, and cold winds from adjacent snow-covered mountains continual, penetrating the forest lands, and the soil becomes ice-bound, sometimes for days together. On a

mountain in latitude $36^{\circ} 30'$ I have taken a variety of this species, with an almost bright blue thorax, and here, on the 15th June last, I traversed snow at intervals, some feet in thickness, under the trees.

The next species is *D. Fortunei*, found in lat. $38^{\circ} 30'$, on Awasima, by the late Dr. Adams, and I will remark three things regarding it: the ♂ has the tarsi (in common with the next two species) very slightly dilated, the thorax is bronzed, and I presume it inhabits a colder climate than *D. pandurus*, as the Kuro-suwo, or warm stream of Japan runs up the east coast, and the west has no such pleasant influence.

Recently, in latitude 41° , I have taken a series of a species with the head and thorax of a rich coppery-red hue, and elytra green and partly metallic. Finally, crossing the strait of Tsugar to the island of Yezo, we find *D. rugipennis*, another bright coloured species. Both the last are near allies, and agree with *D. Fortunei* in general outline and form of the tarsi. In the district of *D. viridipennis*, the new species, snow lies on the length and breadth of the land three or four months in the year, and there is frequently snow remaining on some of the higher mountains throughout the summer, and a similar, though somewhat colder, climate prevails in South Yezo. The mean temperature in latitude $43^{\circ} 3' 56''$ N. was, in January, 1878, at 7 a.m., 16° F., and in July, only 64° , and August, 65° , and the depth of snow (*mean*), January, 11 inches, and February, 48 inches.

I am endeavouring to discover whether *Damaster* in any form exists on the north-east coast, in latitude 44° , for there the Kuro-suwo leaves the coast, and the sea in mid-winter is a mass of ice for two miles from the shore, and, following the rule of the others, a small highly coloured species would occur here, if the genus extends so far.

Thus we see in tracing *Damaster* from the south to the north, species become smaller, and step by step modified in form, with colour appearing the higher we go, either in altitude or in latitude. In the mountains of central Nipon, we have the blue *D. pandurus*, and, in the north, metallic species.

The general change of contour and tarsal development are divergences from the type easily explained by evolution, and, of course, the cause of colour may be bracketed, too, under the same general laws. In the south, the warm nights, with summers of tropical heat, are well suited for the large, nocturnal, black-coloured species we find there; but the genus, in forcing its way north, must, as a warmth-loving creature, accommodate itself to circumstances. Passing from the tropics, it becomes either diurnal or crepuscular (for it gradually enters the regions of twilight), and assumes the colours we naturally

look for in diurnal insects. *D. pandurus* in Yokohama comes freely to sugar, and is well-known to Lepidopterists there, as a nocturnal species, but of *D. rugipennis* I have five examples taken at sap at five o'clock in the afternoon, and I have more than once taken it crossing my path while the sun was well over the horizon.

In a wingless genus, such as the present, it is likely that some of the larger islands may possess species peculiarly their own, and perhaps *D. Fortunei* is one of these; but in this case I should not look for any abnormal variety, but a species closely allied to that of the adjacent land. There is no record at present, I believe, of two species inhabiting the same district.

I add a brief description of the new species above referred to:—

DAMASTER VIRIDIPENNIS, *sp. n.*

D. Fortunei proxime affinis, capite thoraceque late purpureo-cupreis, elytris rugoso-punctatis. sub-viridibus.

Hab.: North Nipon.

Long. corp., 16—18 lin.

Of the same facies as *D. pandurus* and *Fortunei*, the head and thorax are of a rich coppery-red, the latter, with transverse striæ, has a very distinct smooth medial line. The elytra are in colour an obscure green on the disc, gradually brightening towards the base, the margins being quite metallic. The sculpture and punctuation of the wing-cases are after the pattern of *D. rugipennis*, but the punctures are not quite so deep, and the longitudinal striæ are always more or less visible. The colour of the head and thorax is slightly communicated to the under surface of the whole body. The ♂, like *D. Fortunei* and *rugipennis*, has the tarsi perceptibly dilated.

Awomori, Japan:

September 6th, 1880.

Habits of Bombylius.—The following notice is an important addition to the little we know on the habits of *Bombylius*. It is extracted from an article entitled: "The locust scourge," by J. G. Lemmon, contained in the San Francisco Weekly Bulletin, of September 15th, 1880.

"Another enemy (of the grasshopper) which has proved very destructive in Sierra Valley is the larva of an insect whose full grown form was unknown until this spring. It seeks out a nest of eggs, eats the contents of the whole nest (24 to 32 eggs) one by one, pushes the shells aside, while his own body, big and fat with the feast, fills the whole case, in which condition he curls up and enters upon his long winter nap. This dormant stage lasts till spring, during which time the grub is about half-an-inch long and one-fifth thick, being largest in the middle, and tapering slightly towards its head and tail. In this state several specimens, at different times, have been sent to Prof. Riley in Washington, but he failed to perfect them in his vivarium. However, the question has been solved this spring in Sierra Valley. Some earth, with an ascertained number of this larva therein, was carefully watched under glass. In July, a beautiful little velvet-bodied fly, a species of *Bombylius*, appeared, having a long black beak, with which it sucks nectar from flowers, &c."—C. R. OSTEN-SACKEN, Florence: November 16th, 1880.



Beautiful variety of Arctia villica.

—The variety of *Arctia villica* here figured was taken by me some years ago at Guildford and is now in my collection. Unfortunately the margins of the wings are somewhat damaged, as a cat had a hand (or rather a paw) in its capture, but the markings are as

clear as in the sketch. I had overlooked it until overhauling my boxes last season.

I should be glad to know if a similar variety has been met with by other collectors, as this is the only specimen I have seen.—F. WALTER SAVAGE, University School, Hastings: November, 1880.

A list of Micro-Lepidoptera for collectors.—In the last part of the 41st volume of the "Stettiner entomologische Zeitung," recently published, is a list of the Pomeranian *Pyralidina*, *Tortricina*, *Tineina*, and *Pterophorina*, in all 941 species. This list, compiled by F. O. Büttner, with additions by Prof. Hering and Dr. Schleich, is a model of concentrated information, which will not only be, primarily, of great service to collectors in Germany, as giving to all of them in a compendious form knowledge acquired by few, but it may also, for the same reason, be of essential use in this country. With many exceptions, the hitherto known British species are included; of the others it is very possible a good many may yet be found in Britain, and this list may be of much assistance in discovering them; it may also aid in obtaining more examples of some of our rarities; in both cases, by the indications of habitat, season, and larva-food, all or any of which may not be known to us. The list will be especially advantageous to those collectors who rear larvae. The following extract, taken at random, gives a fair idea of the plan of the work:—

GRAPHOLITHA, Tr.

"40 (1131). *Roseticolana*, Z. The moth in June on wild roses. The larva in autumn in the fruit, which thereby becomes discoloured. The transformation in decaying wood, stems of plants or the like. In captivity the larva bores into the dry pith of the elder given to it for that purpose."

Our collectors may also learn, amongst other things, that the law of priority of name is followed as a matter of course; that the uniform ending of specific names in *alis*, *ana*, *ella* and *dactylus*, which was once so much insisted on in this country as the proper thing, is simply ignored in Germany—the fatherland of the literature of *Micro-Lepidoptera*.

It is sad to find, by an obituary notice in the same part of the "Zeitung," that the author of this list, F. O. Büttner, the most assiduous of the Stettin collectors of *Lepidoptera*, and the discoverer of many new species, died on the 4th June last at the early age of 56 years.—J. W. DOUGLAS, 8, Beaufort Gardens, Lewisham: 19th November, 1880.

Notes on Coleoptera in Sussex.—The present season seems to have been particularly favourable to the propagation of the *Bledii*; in company with Dr. Power, on the 16th of August, I visited a locality near Shoreham, which I had long thought would produce something good, and where I had before found *Cillenum*

laterale, and where the Doctor's quick eye and acquaintance with their "casts" had brought *Bledius unicornis* to light. We soon got it in abundance, proving this species not to be confined to the western part of our shores. I had before taken it at Dawlish, where, years ago, Mr. Parfitt discovered it, but I did not then know the little "casts" of sand rejected from their burrows.

In another locality, two miles from here, *Bledius tricornis* was in profusion. The first two or three specimens I found, appear to me to be *spectabilis*, and I am now disposed to doubt the specific value of these two forms. The horn in the males of both this and *unicornis* certainly varies in development, and the infuscation of the elytra is not a sufficient character in itself to warrant their separation.

Here we searched for *Dyschirius extensus*, Putzeys, but in vain; two or three hours' work only yielded three *D. nitidus*, which fell to my share. However, a week after, I had the good fortune, in company with the Rev. H. Gore, to secure eight of this rarity, and Mr. Gore got one more. Our thanks are due to Mr. Brewer, who indicated to us the locality, where he found it twelve years ago.

Having thus got my "eye in" for *Bledii*, numerous casts in my drive and garden footpaths were explored, and turned out to be those of *B. opacus*; while I may mention that while at Dieppe, not long since, *B. longulus* was not uncommon in a sandy part of the cliff.

Other species found at Shoreham were *Pogonus littoralis*, abundant; *Limnaum*, *Heterocerus femoralis* and *sericans*, *Philonthus corvinus*.

I have a specimen of *D. extensus*, taken at Lancing, in 1871, but which, owing to its small size, I had not recognised before.

I lately found in Mr. Gore's collection several specimens of *Cryptocephalus frontalis*, Marsh., Gyll.; he had found them at Rusper, in the precise spot where I obtained one when I was in charge of his parish in 1873. This has always been a rarity with me. This is the season for *Lycoperdina*: it is rather common here in puff-balls.—H. S. GORHAM, Shipley, Horsham: November 17th, 1880.

Sitones ononidis in Suffolk.—On the 29th of September, when sweeping in a rough field in the grounds of Tendring Hall, Stoke-by-Nayland, Suffolk, I took about twenty-five specimens of *Sitones ononidis*. It was not until I had returned home and showed the insect to Dr. Power that I knew what it was. Had I been able to identify it on the spot I could probably have taken more. I have no recollection of seeing any *Ononis* in the field; the plant that was most abundant was the common field-thistle. As this is a new locality for this scarce species, it may be worth recording.—ARTHUR COTTAM, Eldercroft, Watford: November 2nd, 1880.

Capture of a rare Hymenopterous insect near Lyme.—On the 3rd of September last, I captured a ♀ of *Didineis lunicornis*, one of the rarest of our fossorial Hymenoptera, on the top of the Golden Cap Beacon, four miles east of Lyme Regis. I happened to sit down close to it as it was scrambling through the short stunted herbage near the edge of the cliffs.—F. S. SAUNDERS, Wray House, Lingfield Road, Wimbledon: November 15th, 1880.

Oligoneuria rhenana.—On the 25th of August last, I happened to be at Basle with an afternoon and evening to spare. A thunderstorm at 1 p.m. was succeeded by beautiful weather, clear, and with scarcely a breath of wind. So I proceeded to a locality on the right bank of the Rhine, some three miles below the city, where a

little earlier in the season in 1879, some interesting *Trichoptera* were collected. This year, owing to circumstances not known to me, the insects were not of the same set. But I was amply repaid in another way. At a village a little further on, a stream runs into the Rhine almost at a right angle, and at about 5.30 p.m. I saw *Oligoneuria* flying rather wildly up-stream, but in no great numbers. On my way back to Basle there were also a few on the Rhine itself up to 6.30; but at that hour, as if by magic, the air above the river was one mass of *Oligoneuria*, all flying in a steady business-like manner up-stream, and against the little wind there was. They avoided the sides where the current is slower, and the lowest were at least eight feet above the surface, so the fishes had no chance. Such a sight as this is worth a journey from England to an entomologist. It can be no exaggeration to say that millions passed up-stream before I again arrived at the old bridge. This latter disconcerted the swarm, as it was right in the line of flight, and any number could there be caught in the hand. Even the usually stolid citizens were struck by the phenomenon, so I suspect the swarm was greater than ordinarily. If there were a stopping-point, up-stream, the accumulations there must have been enormous.

One interesting observation was made, viz: that *Oligoneuria* casts its subimaginal skin when on the wing, and does not rest to do it, as do other *Ephemeridæ*. Mr. Eaton tells me he also has made a similar observation, and is of opinion that the pellicle on the wings is not shed with that of the body, because he could never find this sheathing of the wings on the cast skins. *O. rhenana* occurs also at Zürich. —R. MCLACHLAN, Lewisham: November 1st, 1880.

Charagochilus Gyllenhalii macropterus.—The common *C. Gyllenhalii*, of short broad-oval form, has the elytra not longer than the abdomen, the cuneus and membrane being abruptly deflected and closely incumbent thereon. On the 26th September, 1879, in Darenth Wood, I swept up an example (♂) which agrees with the characters of this species except that the elytra are not deflected but horizontal throughout and extend far beyond the end of the abdomen, the membrane especially being enlarged both in length and breadth. The antennæ, particularly in the second joint, and the posterior tibiæ are longer than in the usual form. The length of the insect is 2 lines fully. I cannot find that this macropterous form of this species has ever been observed, and I think, therefore, that it is uncommon and worth noting.*

Reuter, in his "Genera Cimicidarum Europæ," puts *Charagochilus*, Fieb., *Systratiolus*, D. & S., and *Paciloscytus*, Fieb., as sub-genera of one genus, to which I see no objection; but he calls this genus *Paciloscytus* of Fieber, which it evidently is not—but of Reuter only. If the names are to be regarded merely as generic appellations which may be used without reference to the application given to them by their author, then any one of them would do as a collective term; in point of fact, *Charagochilus* has numerical precedence in Fieber's "Criterien zur generischen Theilung der Phytocoriden" (Wiener ent. Monatsch., ii, 1858).—J. W. DOUGLAS, Lewisham: November 15th, 1880.

Macropterous forms in the genera Blissus and Plinthisus.—In connection with the foregoing note on maximum development, I may draw attention to the interesting

* See the remarks of Dr. Reuter on polymorphism in Hemiptera in the Ann. Soc. Ent. France, 1875, p. 225.

articles by Prof. Karl Sajó, in the "Ent. Nachrichten" of November 1st, on the discovery in Hungary of the hitherto unknown macropterous forms of *Blissus Doriae*, Ferrari, and on the capture of several macropterous examples of *Plinthinus convexus*, Fieb., hitherto very rare. I quote his remark on the most probable means of procuring fully developed forms: "According to my experience hitherto I can say that the larvæ are the best guides to the obtaining of macropterous examples. Where there are many larvæ and at the same time but few examples perfected, there may the most assiduous search be made; but where many brachypterous forms are already developed and only few larvæ left there is not much to be expected, at least I have sought in vain in such places. Perhaps this happens because the macroptera are first developed and then fly off. I am quite convinced that all the species of *Plinthinus* have a macropterous form."—ID.

Bothynotus pilosus at St. Leonards.—During June or July last year my brother brought me, with some *Rhopalotomus ater*, a developed ♀ of the above from the Cuckmere District. Thinking it was a variety of *Rhopalotomus* I did not make a note of the date or ask him the exact locality. Mr. E. Saunders kindly determined it for me later on.—E. P. COLLETT, 12, Springfield Road, St. Leonards: November, 1880.

Bothynotus pilosus, Boh. (Minki), near Hastings.—Two years ago my friend, Mr. Frank Collett, met with a fully developed female of this species somewhere near St. Leonards. This autumn (September 28th) I have taken two undeveloped females in a sand-pit within a short distance of the Rectory here. The sand-pit is situate on the outskirts of a wood of considerable extent. The occurrence of this species in the South of England is, I think, of considerable interest, since the only previously recorded station in Britain is, "On the hills between Loch Long and Loch Lomond," as recorded in Ent. Mo. Mag., vol. ii, p. 276, where the insect is fully described. Both sexes of the insect are figured in Ent. Ann., 1866, where it is said to be "of great rarity on the Continent."—E. N. BLOOMFIELD, Guestling Rectory: November 19th, 1880.

[These captures of *Bothynotus* in the South of England are of great interest. Reuter says it lives on *Pinus abies*, and he mentions that he took a ♂ in Finland in August and the larva in July. It is to be hoped, therefore, that a diligent search on the spruce firs in August and September may be rewarded with more specimens. The ♀ of this species is generally brachypterous, and a fully developed specimen, such as that taken by Mr. Collett, is of great rarity.—EDS.]

Capture of British Hemiptera-Heteroptera.—On the 31st July of this year, I revisited the locality (Croyhamurst, Croydon), where I took the 3 ♀ of *Atractotomus magnicornis* (noted in the last Vol. of this Magazine), the year before, this time I got about a dozen ♀ and 1 ♂, I expect I was too late for the ♂, and that they should be looked for in the beginning of July.

On the 28th July, I went to the locality on Wimbledon Common where my nephew, Mr. F. Saunders took *Lygus limbatus* last year, and I succeeded in finding one ♀, after a long search, on the shallows. I went again on the 14th August, and got two more; my nephew has also taken two, but this year, at any rate, it seems to be very scarce, all the specimens I have seen are ♀. Last year in August I took

at Hastings a good many specimens of a *Dicyphus* off *Epilobium*, which seemed strange to me; these I sent to Dr. Reuter, and he returned their names as *D. stachydis*, Reut., a species I believe undescribed at present but already recorded from Scotland by Mr. G. Norman. In the developed form it resembles *pallidus*, but may be known at once by its short thick antennæ.—EDWARD SAUNDERS, Holmesdale, Upper Tooting: November 18th, 1880.

The pursuit of Entomology under difficulties in Belgium.—The Belgian Entomological Society has recently organized frequent excursions. One of these took place on the 11th July, to Calmpthout, north of Antwerp, a very favourable and productive locality, unenclosed and primitive in its nature, and part of the State domains. The result was that the party encountered a keeper ("garde champêtre") and two policemen ("gendarmes"), and that several Members of the Society were summoned to appear before the tribunal at Antwerp on a charge of trespassing. It so happened that the father of one of the parties is a magistrate and a distinguished legal official, and he procured the acquittal of his son and colleagues, by discovering that the law applying to trespassers left discretionary power with the judge in connection with the objects of the accused; in effect, the words are "*pourront être condamnés*," and not "*devront être condamnés*," as the keeper and policemen preferred to read them. It was advised that the Members of the Society should in future provide themselves with official cards of permission, so as to avoid being again exposed to misinterpretation of the law on the part of ignorant subordinate officers.

Review.

MONOGRAPHIE DER DEUTSCHEN PSOCIDEN, mit besonderer Berücksichtigung der Fauna Westfalens, von H. KOLBE (Auszug aus dem Jahresbericht der zoologischen Section für Westfalen und Lippe, 1879—80, pp. 73—142, pl. i—iv).

European *Psocida* are now receiving much attention. Very recently two important faunistic memoirs on the Family appeared, viz., those by Spångberg and Rostock on the Scandinavian and Saxon species respectively. And now Herr Kolbe shows that he has for some time been assiduously devoting his attention to it: the result is the production of one of the most important Monographs that has yet been published. The introductory portion is full in details. The author's generic arrangement and his ideas of the system of neuraction, were foreshadowed in the Stettiner ent. Zeitung for this year, pp. 179—186. We are inclined to believe this neural system will not bear the test of analysis with regard to the homologies of neuraction in other groups of so-called *Neuroptera*, but in a notice such as this, it is impossible to enter into details. We think, also, that too many genera have been founded; they may be tolerably natural so far as they go, but the necessity for elevating some of the groups to the rank of genera is much open to doubt, at any rate until a comprehensive study of the Family as a whole has been made. It is to be regretted that the author has applied names, as varieties, to certain slight vagaries of neuraction not infrequent in these insects. Moreover, we cannot agree with the author in his great change of specific nomenclature in some cases. *Psocus longicornis* becomes *Ps. saltatrix*, although the author admits it is only "*höchst wahrscheinlich*" that Linné had this insect before him when he described his "*Phryganea saltatrix*?" another extraordinary innovation is made in the case of

Ps. nebulosus, which becomes *Ps. nebuloso-similis*, because Stephens described the ♀ as *nebulosus* and the ♂ as *similis*. Neither do we agree with the author in his appreciation of the genera *Troctes* and *Atropos*. But the friendly criticism of his fellow-workers will, no doubt, influence him in these respects; and his innovations are not bound to be accepted because they have been made.

In most other respects we know not how to sufficiently admire the care and labour everywhere evident, and the figures will be found of great service; this we say after having made a preliminary test examination with our own collection before us. The notes on habits are extremely interesting and very full. We welcome the advent of so careful and thorough a student of *Neuroptera*.

ENTOMOLOGICAL SOCIETY OF LONDON.—October 6th, 1880. H. T. STANTON, Esq., F.R.S., &c., Vice-President, in the Chair.

Sir Arthur Scott, Bart., of 97, Eaton Square, W., and Mr. F. E. Robinson, of Oxford, were elected Members.

Mr. McLachlan reminded the Meeting that at the October Meeting last year he had exhibited specimens of *Anthocoris nemorum* which had been considered to be occasioning damage to hops (*Ent. M. Mag.*, xvi, p. 141), and suggested they were only in search of some insect that was the actual culprit. The same correspondent had just sent him Dipterous larvæ (exhibited) extracted from the centre of the hop cones, and the cause of the mischief, which, however, was much less this year than last.

Sir S. Saunders exhibited apterous females and a winged male of *Scleroderma* bred from the cell of *Rhaphiglossa* in a briar stem from Epirus, thus authenticating the sexes of this genus.

Mr. W. F. Kirby exhibited varieties of *Argynnis Selene* taken by his son at Düsseldorf; two remarkably fine hermaphrodite examples of *Smerinthus populi* bred by Mr. Shuttleworth; a dark variety of *Hemerophila abruptaria* taken in London by Mr. Olliffe; and an hermaphrodite *Ennomos angularia* bred by Mr. Hudson.

The Rev. E. N. Geldart exhibited a variety of *Argynnis Selene* captured near Reigate.

Mr. Rolfe exhibited *Vanessa Antiopa* taken on Wimbledon Common on the 24th August last; *Acontia solaris* captured at Eastbourne on the 12th August; and a pale variety of *Plusia gamma*.

Mr. H. Ramsden communicated notes on two examples of *Pyrophorus causticus*, the fire-fly of Cuba, which he had brought alive to England.

Mr. A. H. Swinton read two papers on the effects of food in producing variability in *Lepidoptera*, more especially with regard to *Vanessa urticæ* and *Arctia caja*.

Mr. Butler communicated a paper on the genus *Terias*, with descriptions of new species from Japan.

Mr. C. O. Waterhouse communicated a paper on *Buprestidæ* from Madagascar.

Mr. Kirby called attention to the fact that M. E. André, who is publishing a work on *Hymenoptera*, is in the habit of printing descriptions of new species on slips loosely inserted in the parts of his book, apparently in order to secure priority. A discussion followed, in which several Members expressed strong opinions of regret.

that it was not possible to enforce a rule ignoring such descriptions. A discussion also ensued as to whether or not the cover of a periodical or work was part of the publication. On this point difference of opinion was manifested, but the general idea was in the affirmative.

November 3rd, 1880. SIR J. LUBBOCK, Bart., M.P., F.R.S., &c., President, in the Chair.

Mr. E. Meyrick, of Ramsbury, Wilts, and Capt. Thos. Broun, of Auckland, New Zealand, were elected Ordinary Members, and Dr. E. Brandt, of St. Petersburg, was elected a Foreign Member.

Mr. C. O. Waterhouse exhibited, on behalf of Mr. Olliffe, a pair of dwarfed examples of *Epione cespertaria* taken at Arundel.

Mr. McLachlan exhibited the singular *Eucalyptus* galls described and figured in the present number of this Magazine. He stated, also, that in a letter received from Mr. D. G. Rutherford, from Camaroons, W. Africa, the writer mentioned that he had taken *Papilio Merope* and *P. Cenea* in copu'l, and had obtained eggs from which larvae were hatched. Mr. Roland Trimen thought an error had occurred as to the name *Cenea*, and that the ♀ was more probably *Hippocoon* or one of the other W. African polymorphic forms of the ♀ of *Merope*. The statement was interesting as confirming the relationship of one of the forms.

Prof. Westwood exhibited saw-fly galls on a sawow, apparently not of the usual form; and a drawing of a very singular dipterous larva found on a stem of *Pyrolænum*, and no doubt pertaining to the *Syrphide*.

Mr. W. F. Kirby exhibited, on behalf of the Rev. J. K. Brown, of Maidstone, a remarkable variety of *Ephedra latifolia*; and on behalf of Mr. Rolfe a specimen of *Ayasura lili* which the latter affirmed he had caught in Pinner Woods last July. It was remarked that this example of *A. lili* was apparently old and had evidently been twice pinned.

Sir John Lubbock exhibited larvae from the Troad, which Mr. Calvert had forwarded through Sir J. D. Hooker; they had lately been found in considerable numbers feeding on the eggs of *Loxoste* and were probably those of some species of *Carcharias*; very many loxoste eggs had been destroyed by them, and it was suggested they might perhaps be imported into Cyprus.

Mr. Roland Trimen exhibited the singular apterous Hymenopterous insect already noticed at the Meeting of the 7th July from near Cape Town, which he strongly believed was the ♂ of *Dorylus lativittatus*; it had been found in a nest of a small red ant apparently of the genus *Lasius*, and the workers of this were ascribed to a winged female referable to Germaker's genus *Leptochalcid*, which that author regarded as probably the ♂ of *Dorylus*. He also exhibited more formed by a South African *Lepidogaster* larva: they were formed of sand, somewhat flattened, and along each side were attached large rough fragments of stone in a single row, thus giving the nest much the aspect of a Myrmecod. the larva was regarded as venomous by the Natives.

Sir S. S. Saunders read a paper on the habits and affinities of the Hymenopterous genus *Scoliodermus*.

Mr. E. Saunders read a Synopsis of British *Emeryus* and Fossorial *Hymenoptera*.

Professor Westwood read descriptions of new species of exotic *Diptera*.

NOTES ON *MACRO-LEPIDOPTERA* IN THE NEW FOREST IN 1880.

BY W. H. B. FLETCHER.

Having stayed at Lyndhurst from the middle of April to the end of September, with the exception of the month of June (which I spent at Wicken), I venture to send a short account of my captures, from which it will, I think, appear that 1880 has not been altogether a bad year for collectors in "The Forest."

Colias Edusa was very scarce, I did not see a specimen myself, and heard of only a very few being seen by others. *Argynnis Paphia*, var. *Valezina*, was, as usual, common. In August, 1879, I obtained a batch of about sixty eggs from a worn specimen of this form, the larvæ hatched out in September, they did not seem to touch their food-plant, but began to hibernate at once; and Mr. George Tate tells me that a few larvæ obtained by him this year acted in the same way. For want of care on my part, most of these little larvæ died in the winter; thirteen, however, survived, and fed freely on *Viola odorata*, *V. sylvatica*, and *V. canina*, the last-named being their food-plant in the New Forest. I obtained eleven pupæ, and bred from them, towards the end of June, 1880, three males and three females of the typical form, and five of the form *Valezina*.

Cynthia cardui, abundant here, as elsewhere, in 1879, in the present autumn was less common than usual, although the spring specimens were plentiful. The latter, owing to the bright sunshine in April and May, were a week or ten days earlier on the wing than they usually are in this district.

The larvæ of *Demas coryli* were plentiful on all kinds of trees from June to October, but absolutely swarmed in September.

Limacodes asellus occurred sparingly in July on the wing, and a few larvæ were taken by Mr. Styan and myself off oak and birch in September.

Lithosia quadra was plentiful in the larva, pupa, and imago states, and *L. helvola* was not uncommon towards the end of July.

In the spring, *Nola cristulalis* was very common on the trunks of trees, and its larva was beaten freely from beeches in June and July.

The larvæ of *Ellopija fasciaria* were plentiful on Scotch fir in the spring, as were also those of *Selenia illustraria*, *Eurymene dolabraria*, and *Odontoptera bidentata*, on all kinds of trees, towards the end of summer, some of the varieties of the last-named larva being very beautiful.

that it was not possible to enforce a rule ignoring such descriptions. A discussion also ensued as to whether or not the cover of a periodical or work was part of the publication. On this point difference of opinion was manifested, but the general idea was in the affirmative.

November 3rd, 1880. SIR J. LUBBOCK, Bart., M.P., F.R.S., &c., President, in the Chair.

Mr. E. Meyrick, of Ramsbury, Wilts, and Capt. Thos. Broun, of Auckland, New Zealand, were elected Ordinary Members, and Dr. E. Brandt, of St. Petersburg, was elected a Foreign Member.

Mr. C. O. Waterhouse exhibited, on behalf of Mr. Olliffe, a pair of dwarfed examples of *Epione vespertaria* taken at Arundel.

Mr. McLachlan exhibited the singular *Eucalyptus* galls described and figured in the present number of this Magazine. He stated, also, that in a letter received from Mr. D. G. Rutherford, from Camaroons, W. Africa, the writer mentioned that he had taken *Papilio Merope* and *P. Cenea in copula*, and had obtained eggs from which larvæ were hatched. Mr. Roland Trimen thought an error had occurred as to the name *Cenea*, and that the ♀ was more probably *Hippocoon* or one of the other W. African polymorphic forms of the ♀ of *Merope*. The statement was interesting as confirming the relationship of one of the forms.

Prof. Westwood exhibited saw-fly galls on a saw, apparently not of the usual form; and a drawing of a very singular dipterous larva found on a stem of *Pelargonium*, and no doubt pertaining to the *Syrphida*.

Mr. W. F. Kirby exhibited, on behalf of the Rev. J. K. Brown, of Maidstone, a remarkable variety of *Epunda lutulenta*; and on behalf of Mr. Rolfe a specimen of *Apatura Ilia* which the latter affirmed he had caught in Pinner Woods last July. It was remarked that this example of *A. Ilia* was apparently old and had evidently been twice pinned.

Sir John Lubbock exhibited larvæ from the Troad, which Mr. Calvert had forwarded through Sir J. D. Hooker; they had lately been found in considerable numbers feeding on the eggs of Locusts, and were probably those of some species of *Cantharida*; very many locust eggs had been destroyed by them, and it was suggested they might perhaps be imported into Cyprus.

Mr. Roland Trimen exhibited the singular apterous Hymenopterous insect (already noticed at the Meeting of the 7th July) from near Cape Town, which he strongly believed was the ♀ of *Dorylus helvolus*; it had been found in a nest of a small red ant apparently of the genus *Anomma*, and the workers of this were attached to a winged female referable to Gerstäcker's genus *Dichthodia*, which that author regarded as probably the ♀ of *Dorylus*. He also exhibited cases formed by a South African Lepidopterous larva; they were formed of sand, somewhat flattened, and along each side were attached larger rough fragments of stone in a single row, thus giving the case much the aspect of a Myriopod; the larva was regarded as venomous by the Boers.

Sir S. S. Saunders read a paper on the habits and affinities of the Hymenopterous genus *Scleroderma*.

Mr. E. Saunders read a Synopsis of British *Heterogyna* and Fossorial *Hymenoptera*.

Professor Westwood read descriptions of new species of exotic *Diptera*.

NOTES ON *MACRO-LEPIDOPTERA* IN THE NEW FOREST IN 1880.

BY W. H. B. FLETCHER.

Having stayed at Lyndhurst from the middle of April to the end of September, with the exception of the month of June (which I spent at Wicken), I venture to send a short account of my captures, from which it will, I think, appear that 1880 has not been altogether a bad year for collectors in "The Forest."

Colias Edusa was very scarce, I did not see a specimen myself, and heard of only a very few being seen by others. *Argynnis Paphia*, var. *Valezina*, was, as usual, common. In August, 1879, I obtained a batch of about sixty eggs from a worn specimen of this form, the larvæ hatched out in September, they did not seem to touch their food-plant, but began to hibernate at once; and Mr. George Tate tells me that a few larvæ obtained by him this year acted in the same way. For want of care on my part, most of these little larvæ died in the winter; thirteen, however, survived, and fed freely on *Viola odorata*, *V. sylvatica*, and *V. canina*, the last-named being their food-plant in the New Forest. I obtained eleven pupæ, and bred from them, towards the end of June, 1880, three males and three females of the typical form, and five of the form *Valezina*.

Cynthia cardui, abundant here, as elsewhere, in 1879, in the present autumn was less common than usual, although the spring specimens were plentiful. The latter, owing to the bright sunshine in April and May, were a week or ten days earlier on the wing than they usually are in this district.

The larvæ of *Demas coryli* were plentiful on all kinds of trees from June to October, but absolutely swarmed in September.

Limacodes asellus occurred sparingly in July on the wing, and a few larvæ were taken by Mr. Styan and myself off oak and birch in September.

Lithosia quadra was plentiful in the larva, pupa, and imago states, and *L. helvola* was not uncommon towards the end of July.

In the spring, *Nola cristulalis* was very common on the trunks of trees, and its larva was beaten freely from beeches in June and July.

The larvæ of *Ellopiæ fasciaria* were plentiful on Scotch fir in the spring, as were also those of *Selenia illustraria*, *Eurymene dolabraria*, and *Odontoptera bidentata*, on all kinds of trees, towards the end of summer, some of the varieties of the last-named larva being very beautiful.

The larva of *Cleora glabraria* was common on the long lichens growing on beech, hawthorn, and oak, and the imago was obtainable from the same trees in July and August. All the species of *Boarmia* and *Tephrosia* were abundant, with the exceptions of *B. rhomboidaria* and *abietaria*, this latter I cannot find in any number in the Forest, having never taken more than two larvæ or imagines in a year, although I have several times beaten the yew trees for them.

The larvæ of all the *Ephyra* were common in September, except that of *E. porata*, which I hardly know, the imago is, however, rare here, according to my experience. *Acidalia emutaria* and *straminata* seemed less common than usual; I netted a few *A. emarginata* one evening in Matley Bog.

I took three *Macaria alternata*, ♀, on as many nights, in the bogs, but the larvæ obtained from them did badly on willow; but, fortunately, I beat a few full-fed off alder in August, together with some of *Eupisteria heparata*, the latter being abundant in larva and imago states. Amongst the *Eupithecia*, *centaureata*, *lariciata*, *albipunctata*, *exiguata*, *pulchellata*, and *abbreviata*, were more or less common as larvæ or imagines. *E. irriguata* was scarce on the wing, and, perhaps, more so than it would otherwise have been, had not the east winds, which prevailed throughout April and May, made it so hard to "spot" when beaten out of the oak trees. The larvæ, I learn, were fairly common in June.

The larvæ of *Collix sparsata* were, as usual, very common on the under-side of the leaves of *Lysimachia vulgaris*, in August, and those of *Lobophora sexalata* and *Scotosia undulata*, were not scarce on willows in September, the latter preferring the tufty pony-trimmed bushes, most likely because they are more suitable for the making of their leafy tents. *Cidaria psittacata* swarmed at the ivy in the autumn, and its larva in the summer on oak, ash, and other trees. I was too late for the larva of *Tanagra chærophyllata* (locally "Smut"), so only found six, on the leaves of *Bunium flexuosum*.

All the *Drepanulæ* (except *sicula*) were taken as larvæ and imagines; *unguicula* being the most abundantly taken on the wing, and *fulcula* and *lacertula* as larvæ.

Amongst the *Pseudo-bombyces*, the larva of *Clostera reclusa* was very common on *Salix repens*, those of *Dicranura furcula*, *Notodonta ziczac* and *palpina*, were not scarce on the larger willows; *N. camelinæ* was common on most trees and bushes; and *N. dictæoides* on birch.

Stauropus fagi seems to have been more abundant than usual. I have heard of the capture of about forty specimens taken chiefly

between June 15th and July 10th, three of them fell to my lot, the result of three mornings' work. The species seems to have been on the wing for a long time, as I took a ♂ on May-day, and Mrs. Fletcher a ♀ on July 12th in very fair condition. Several of the larvæ were taken in August and September off oak and beech. Amongst the *Noctuæ*, I may mention the larvæ of *Cymatophora ridens* as being common on oak in June and July, of *C. duplaris* and *Acronycta leporina* on alder and birch in August, of *Orthosia lota* on sallow in the spring, and of *Erastria fuscula* in September on the long grasses growing under the fir-trees in the enclosures. I believe that the larvæ of *Hadena contigua* were plentiful on *Salix repens* and *Myrica gale* towards the end of the summer, but, unfortunately, I did not learn to know this larva until they had nearly all pupated, when Miss Golding-Bird kindly told me that the few remaining in my cage belonged to this species. I must now end these already too lengthy notes with an account of the unusual number of *Acronycta alni*, which have been taken in the Forest this year. About the middle of June, Mr. George Tate took a female of this species at rest on an old hawthorn. On July 17th, Mrs. Fletcher took a larva in the "bird's dropping" stage, and between this date and the end of the third week in August, one hundred and ninety larvæ were taken to my knowledge, thirty-six having fallen to the lot of my wife and self. By far the greater number of these were taken off alder, though several came off beech and oak, a few off birch, and I saw Mr. Norgate take one off hawthorn. Unfortunately, the saying, "No rose without a thorn" holds good with regard to these larvæ, for they are infested with parasites. First of all, there is a solitary grub which comes out of the larva when it would cast off its "bird's-dropping" skin, and don its gorgeous livery, and spins a piebald cocoon; then there are, I think, two gregarious species which, in parties of from four to twelve, crawl out of their victim when it should pupate and make dark-red cocoons; these pests have already reduced my stock to twenty, while my friends, Job's comforters indeed, tell me that were I to open the sticks thought to contain pupæ of *alni*, I should find yet more blood-red cocoons, and also that there is another species of parasite making its pupa within that of its victim. Should, however, any of these destroyers prove to be of interest, I shall hope to be able to hold them up to the execration of Lepidopterists in the pages of a future number of the E. M. M.

Bersted Lodge, Bognor, Sussex :

December 10th, 1880.

ON THE SPECIES OF THE GENUS *ORTHEZIA*.

BY J. W. DOUGLAS.

Two years ago, Mr. Henry Chichester Hart sent for my inspection examples of an *Orthezia* he had found in Ireland, saying that they appeared to him to be identical with a species he obtained at Disco, North Greenland, which had been named for him *Dorthesia chiton*, Zett., that it also seemed to be the same as *Coccus cataphractus*, Shaw, and requesting my opinion. My reply was that I believed it to be *Orthezia Signoreti*, F. B. White, that it seemed to agree with the species described by Shaw and Zetterstedt, and that both these latter and several others had been referred by Signoret, the latest writer on the subject, to *Orthezia (Aphis) urticae*, Linné. An article in the "Entomologist" for November, by Mr. Hart, on *Dorthesia chiton*, has been read by some of my correspondents to mean that I agreed with Signoret's conclusion, but I merely stated a recorded fact, not having at that time investigated the question. It would be superfluous now for me to say this, but that it gives me the opportunity to offer some remarks indicating that two species are confounded under the name *urticae*. These remarks were prepared long since, but reserved, because Mr. W. F. Kirby informed me that Mr. Hart intended to work out the matter thoroughly.

The species of this genus are dimorphous, that is, as in other *Coccina*, the males only are winged in the imago state. The following is the substance of Signoret's summary of the peculiarities in the natural history of the apterous forms (*Essai sur les Cochenilles*, p. 421)—particulars it is essential to know:

"We find examples having six joints in the antennæ, these are the young larvæ; others with seven joints, more or less equal in size; others, also with seven joints, with a kind of scape, as in the *Hymenoptera*; finally, others with eight joints, these being the adult females. The individuals with seven joints have a peculiarity that we have not seen in any other genus (those in which the joints are of regular form are the female larvæ), namely: that those with the scape have in all the legs the tibia and tarsus united, and thus form but a single joint. It is not, therefore, wonderful that authors have indicated a certain number of species, which, up to this time, we have not been able to find in the many places where we have collected these insects."

Of the apterous forms two kinds exist, for while in both the whole body, above and below, is covered with a close-fitting, wax-like (Signoret calls it calcareous), white secretion, and in both there is a wide, raised, segmented border formed of this matter, there are yet two great differences, *constant throughout all the stages of life*, in the other dis-

position of it in the two forms, offering *primâ facie* evidence that there are two species, and not merely different stages of development in one species as has been stated. (1). In one type the upper surface is smooth, almost flat within the border (which also is regular, compact, and smooth), and destitute of imbrication, the segments being distinctly visible from side to side, only divided in the middle by a continuous, longitudinal, impressed line. (2). In the other type the border is less regular and more flaky, especially in the adult, and the whole dorsal surface is covered with protuberant, overlapping, scale-like or flaky lamellæ in two longitudinal rows or ridges, whereby the segmentation of the body is quite hidden.

(1.) In the first type there are, in the adult ♀, other specialities:—the broad, short-oval form, the pale cream-white colour, the testaceous colour of the legs and antennæ, the tarsus as long as the tibia; the antennæ short, stout throughout; the broad caudal lamination projecting beyond the border to a comparatively short extent, its extremity broadly rounded, its surface longitudinally crenate (not lamellate). This caudal projection arises below the circumferential border of the body, which remains entire: it forms the covering part of the *marsupium*, which contains at first the eggs, and then the young larvæ. (The same kind of structure, but of larger dimensions, exists in *O. urticae*.) To this type belong, as one distinct species (*O. cataphracta*),—

♀. *Coccus cataphractus*, Shaw, Nat. Misc., v, pl. 182 (1791), Gen. Zool., vi, 194, pl. 62 (1806).

♀. *Dorthisia cataphracta*, West., Intr. Mod. Class. Ins., ii, 443, fig. 118, 20 (1840).

♀. *Dorthisia chilon*, Zett., Ins. Lap., 314 (1840).

♀. *Orthezia urticae*, Sign. *syn. partim*, Essai sur les Cochenilles, 423 (1875).

♀. *Orthezia Signoreti*, F. B. White, Scot. Nat., iv, 160, pl. 2, fig. 1, antennæ (1877).

In the Scotch examples, for which I am indebted to Dr. F. Buchanan White, there is, on the middle line of each of three anterior (thoracic) segments, a very small scutelloid process or appendage: these are represented in Shaw's figure, but are exaggerated.

The adult ♂ has not been observed, but Dr. Buchanan White says (*l. c.*): "I have only seen one ♂ larva, and that not in good condition, but, as far as I could judge, the antennæ resemble in structure that of the larva of *urticae*."

The species appears to have been found only in northern regions—Lapland, Greenland, Norway, Scotland, Ireland, and the north of England.

(2.) In the second type, in the adult ♀, the other characters to be noted are:—the long-oval form; snow-white colour; the piceous

hue of the legs and antennæ; the tarsus but little more than half the length of the tibia; the antennæ longer and thinner than in *O. cataphracta*, the terminal joint tapering; the broad caudal lamella, which follows the two dorsal ridges, projecting very much in the rear, but slightly rounded posteriorly, its whole surface covered by a large fascicle of long, longitudinal, thin, sharp-edged lamellæ, into the base of which the posterior lamellæ of the border merge, these latter being longer throughout than in the previous stages of the insects' life. To this type belong, as one distinct species (*O. urticae*), the ♀ of the following:—

♀. *Aphis urticae*, Linn., S. N., 736, 30 (1767).

[Frisch, Besch. v. allerly Insecten von Teutschland, viii. 34, t. 17 (1730)].

♀. *Coccus floccosus*, De Geer, Mém., vii, 604, 9, pl. 44, fig. 6 (1778).

♀. *Orthesia characias*, Bosc, Journ. de Phys., xxiv, 171, pl. 1 (1784).

♂ ♀. *Dorthesia characias*, l'abbé d'Orthez, id., 207, pl. 1, fig. 14—16 (1785).

♂. " " Westw., Intr. Mod. Class., ii, 445, frontisp., fig. 8 (1840).

♀. *Coccus dubius*, Fab., E. S., iv, 228, 27 (1794), Panz., F. G., 35, 21.

♂ ♀. *Coccus characias*, Fab., S. R., 311, 29 (1803).

♂ ♀. *Dorthesia urticae*, Burm., Handb., ii, 76, t. 2, fig. 6 & 11 (1835).

♀. " " Zett., Ins. Lap., 314 (1840).

♂ ♀. *Orthesia urticae*, Amy. et Serv., Hémipt., 624 (1843).

♂ ♀. " " Sign., Ess. Cochinelles, 423 (1875), (*syn. partim*), pl. 1, fig. 13, ♂ larva; pl. 21, fig. 1, ♂ imago; fig. 1, *g, h, i*, antennæ of embryo and ♂ and ♀ larva; fig. 1, *m*, ♂ genitalia.

A few words on some of this synonymy may be permitted. Linné says of the *Aphides* generally: "Species difficile distinguuntur, difficius definiuntur," which is especially well illustrated in his description of *A. urticae*, as follows:—

"Inter maximas hujus generis, tota alba, obtecta quasi setis; subtus vero lana alba, postice valde obtusa; de genere hæreo, utrum ad *Aphides* aut *Chermes* accedat."

This is vague enough, but reference is made to the antecedent work of Frisch, in which, under the title, "Von der weissen Blat-Lause auf der Matricaria," is a description from which the following is an extract:—

"Der Nacken ist mit drey über sich stehenden Blätlein bedeckt. Mitten auf dem Rücken geht eine Linie durch, welche neben mit zwey Reihen solcher weissen Blätlein besetzt ist, deren auf jeder Reihe sieben, als Schuppen über eine ander liegen. Der Leib ist oval, wenn man ihn ohne die Schabe betrachtet, und ist an den Seiten mit viel weissen und kurzen Bürstlein besetzt, als mit Franzen."

This agrees fairly with our insect: the figure is so small and indistinct, that it is worthless.

Fabricius appears to have first identified *characias*, Bosc, with *urticæ*, Lin., but apparently he was not very sure, for he uses the latter only as synonym of the former, which he still keeps, with an expression of doubt, as a *Coccus*. (S. R., p. 311.)

Of De Geer's species the figure is rude and unsatisfactory, but the description, as follows, is sufficient to denote our species:—

"Ce sont un grand nombre de flocons cotonneux en forme de lames feuilletées plates d'un blanc éclatant, qui couvrent tout le dessus du corps et le débordent même de tous les côtés; ces lames, qui sont un peu courbées, y sont placées très-régulièrement, se couvrent un peu les unes les autres, ou arrangées comme des tuiles ou comme les écailles des poissons; il y en a d'abord une couche au milieu du corps, plus courtes que les autres et arrangées sur deux lignes, de façon que celles de l'une de ces lignes vont rencontrer celles de l'autre rang par leur base, et elles représentent ensemble comme une petite feuille découpée. Les autres lames placées de deux côtés de la tête jusqu'au derrière, et formant deux rangs distincts, sont beaucoup plus longues que celles du milieu, comme je l'ai dit, débordant le corps considérablement, et elles sont toutes un peu courbées et dirigées vers le derrière."

Zetterstedt described *urticæ* in order to point out the differences between it and his *chiton*.

The descriptions of *Coccus uva*, Modeer, and *Dorthesia Delavauxi*, Thibaut, both referred to this species by Signoret, I have not been able to see.

Burmeister (*l. c.*) refers "*Coccus glechomæ*, Fabr." (without further indication), to the genus *Dorthesia*, as a distinct species, but I cannot find the description.

The male is described as of a light brown colour, smaller than the female, elongate; the head, thorax, and abdomen distinct; no rostrum; the antennæ very long, filiform, 9-jointed; wings, two (anterior), long, pale-greyish, with two longitudinal nervures (Westwood says there are also two minute halteres, terminated by a short seta); the abdomen at its termination with a pencil of long, fine, white hairs. The genitalia are of peculiar form.

The male, according to the observations of its original discoverer, as given by Amyot and Serville, *op. cit.*, p. 623, is polygamous.

"It is in the month of September, after the third or fourth moult, that the males appear, but only few in number. The author says that it was with much trouble that he found four or five of them among a great quantity of females. More slender than these, they are also more active; they run with their wings elevated from one female to another, and confer their favours according to their caprice. After some days of such a course, the male retires to the root of a plant, under a stone, where its inactive body becomes covered all over with a very fine cottony matter, which has very much the appearance of mouldiness, and there, doubtless, it dies. The females have one moult after coupling, they soon after retire into the

earth, or to protection under stones, appearing on fine days during winter, and thus pass their life without making much growth. When spring comes, they regain their vigour, and then is formed on their hinder part the singular cradle which receives their numerous family. They lay their eggs, and live languidly for more than a month afterwards."

I have never captured or had the male, which it appears is only to be found in the autumn, and although it seems certain that but comparatively few of this sex are developed, yet it may be possible to obtain some by rearing them from the larvæ. The male larvæ, according to Signoret, may be distinguished by the two caudal lamellæ being narrow; by the long, stout, first joint of the antennæ, and the still longer terminal joint (the very peculiar form of the antennæ being altogether abnormal in this family); and by the conjoined tibia and tarsus on all the legs. This *Orthezia* is not scarce in the larva-state, in August and September, in many places, on various plants, and there is, therefore, an opportunity for some of our aspirants to obtain and rear some males to maturity; the history of the last changes would form an extremely interesting article; and the same may be said, in an even greater degree, of the other species.

In the Trans. Ent. Soc. London, N. S., iv, Proceed., p. 5 (1856), is a very interesting and humorous account, by the late Edward Newman, of the birth and infantile life of a brood of *O. characias*, derived from a female that I had given to him early in June.

The generic name *Orthesia*, given by Bosc, in 1784, in honour of the Abbot of Orthez (l'abbé d'Orthez—not Dorthez, as has been stated), was altered in 1785, by the Abbé himself to "*Dorthesia*," which was adopted by Latreille and others, but this not being correct, according to orthographic rule, the original name was restored by Amyot and Serville, written, however, *Orthezia*, as according better with its derivation.

8, Beaufort Gardens, Lewisham :
20th November, 1880.

Note on the food of Bothynotus pilosus.—It would seem from the editorial note (p. 165) that the supposed food-plant of this species is spruce fir. Such was certainly not the case with my specimens. They were females with undeveloped wings, and there is no coniferous tree or shrub within a considerable distance of the locality in which they were taken.

The underwood around the sand-pit consists of oak, hazel, and birch, with some broom at a little distance. I do not know whether any of these are likely to be the food-plant.—E. N. BLOOMFIELD, Guestling Rectory : December 11th, 1880.

THE OCCURRENCE IN HEREFORDSHIRE OF *PEMPELIA HOSTILIS*,
WITH DESCRIPTION OF THE LARVA.

BY JOHN H. WOOD, M.B., AND W. BUCKLER.

I was fortunate enough, last June, to breed three specimens of this rare insect, a species that has not, I believe, been taken in this country for many years.

The larvæ were met with somewhat accidentally. I was hunting one day in the middle of September, 1879, among underwood, for larvæ of the *Closteræ*, when I caught sight of a few strands of silk spun from a brown curled aspen leaf to a living green one. On picking the dead leaf and uncurling it, I saw exposed on its surface a silken tube, at once suggestive of the work of a knothorn, and this supposition became almost a certainty, when the little grey larva, after some persuasion, was prevailed on to show itself. For the rest of the afternoon I had, as may be supposed, eyes for nothing but dead or dying aspen leaves, and the result was two more nests. I call them nests, because I subsequently found that with one exception, in which instance only a single larva was present, the leaves were occupied by two or even three larvæ living together, each in its own gallery, but with the galleries closely joining or even interlacing. The larvæ at this time were very young, and considering the choice they had made (in the one case of a dead leaf, in the other two of the old tenements of other larvæ), might readily have been overlooked; but it was quite a different matter when I found, later in the month, a fourth nest containing two nearly full grown larvæ. As in the others, so there was here, the nucleus of two half dead yellow leaves, but from these were stretching in all directions bands of silk to the adjacent fresh ones, which had been freely eaten, drawing them together and thus making a large and conspicuous object. I sent Mr. Buckler two of the larvæ, and am greatly indebted to his kindness for the description of them given below; unfortunately, both proved to be stung. Mine, when full fed, left their nests. They spun up (four of them) in rolls of paper, and changed to pupæ at once. Being anxious to see the moth, I forced one early in the spring, and was punished with a very bad cripple; the others left to themselves produced fine specimens in June.

The question arises—which selects the site of the nest? Does the parent moth lay her eggs on these old leaves, or do the larvæ wander about till they find them? In favour of the former is the fact, that more than one larva is generally present; nevertheless, I am inclined to think that the latter is the correct view, since the ex-

cise of such a choice seems to fit in better with larval instincts than with those of the perfect state; and, moreover, there was certainly, in one instance, a marked difference in the sizes of two larvæ feeding together.—JOHN H. WOOD.

Tarrington, Ledbury:
22nd November, 1880.

On September 23rd, 1879, Dr. Wood kindly sent me two larvæ of *Pempelia hostilis*, each between two leaves of *Populus tremula*, spun together with silk, to which quantities of frass were adhering.

One larva was full grown, the other quite small and preparing to moult, three-eighths of an inch in length and very slender, with blackish head and collar plates, light pinkish-drab body with dorsal stripe just a tint darker, and having on either side of the back two cream-coloured lines, and along the spiracular region two paler cream-coloured stripes, the lowest slanting downwards just at the end of each segment throughout its course, the ground colour between these and also of the belly paler than that of the back and sides: after moulting on the 26th, it assumed the colour of the full grown example, though it refused to feed, and in course of a day or two a parasitic larva ate its way out, which proved fatal to the unlucky victim, whose shrivelled-up skin alone remained.

The full grown larva measures nearly three-quarters of an inch in length, of moderate slenderness, the head broad and full, about as wide as the second segment, the body tapering behind from the tenth to the end of the thirteenth, the thoracic segments deeply wrinkled, the others with a deep transverse wrinkle a little beyond the middle, the ventral and anal legs short and much beneath the body; the rather shining head is blackish-brown, having a broad ochreous stripe on the crown of each lobe and a streak above the mouth, papillæ black, finely ringed with white; the ground colour of the body is a dingy blackish-olivaceous-brown, darkest on the anal flap, rather glistening on the second segment, but quite dull on the rest of the body, two fine black lines on the collar change from thence to a plain dorsal stripe, rather darker than the ground colour as far as the last segment, where it is black; continuous from either lobe of the head is a broad sub-dorsal ochreous stripe on the second segment, opening out beyond in two lines which, after passing the thoracic segments, become more dingy and somewhat greyish-ochreous, and show but faintly; midway along the side occurs the faintest possible trace of an extra line, thin and indistinct, a sub-spiracular stripe begins on the third segment and

continues of a dirty whitish colour just above the legs to the end of the thirteenth, having a fine line of the ground colour running through below ; the minute round spiracles are of the ground colour, finely ringed with darker, the tubercular dots very small, blackish-brown, and slightly glistening, each with a fine hair ; the ocellated spot on either side of the third and twelfth segments is of the ground colour, ringed with black, and with a minute black centre bearing an extra long hair ; the anterior legs black, the ventral and anal legs of the ground colour. This individual produced an ichneumon on the 25th of June, 1880.—WM. BUCKLER.

Emsworth :

13th November, 1880.

[The re-discovery of this species, the genuine *Phycita hostilis* of Stephens, is of considerable interest. The only recent (probable) record upon which I can put my hand, is at vol. iv, p. 152, of this Magazine, when the late Rev. E. Horton recorded the rearing of a specimen of a *Phycis adelphella* in the year 1860, from a larva found feeding on aspen, near Worcester, and gave a short description of the larva.

The name *hostilis*, Steph., had before that time been superseded in favour of *adelphella*, Fisch., by Mr. Doubleday in his catalogue, but, apparently, without sufficient reason, supposing the species to be *identical*, for Stephens' description, published in 1834, is probably anterior to that of Fischer von Röslerstamm, 1834 to 1843. I also think that Mr. Doubleday must have relied upon a *description* of *adelphella*, and not on a comparison of the insects themselves.

Some years ago Professor Zeller, who had also described *adelphella* in the *Isis* (1846), sent me a type from Silesia, and as Dr. Wood has kindly allowed me to examine one of his specimens, I am able to record the result.

Adelphella (from Zeller) is rather like *formosa*, Haw., but with *narrower* forewings, the costa being regularly curved, the base of forewings brick-red, bounded by a broad, *oblique*, curved, blackish, cloudy fascia, which includes the first line, double, twice angulated, black with a white line between. The remainder of the wing clouded with dark grey, except an ill-defined brick-red blotch along the dorsal margin. Second line double, sinuous, placed far back but very distinct in the cloudy-grey ground colour, central dot also very indistinct. Hind-wings pale grey.

Stephens' description of *hostilis* is as follows : " Anterior wings brownish, with the base somewhat ferruginous and immaculate ; this space is followed by a broadish, waved, fuscous or black fascia, in which is a pale streak ; towards the hinder margin is a second dark fascia, in which is a distinct waved pale streak, slightly angulated towards the inner margin ; the space between them is slightly clouded, and bears a brown lunule towards the costa ; on the hinder margin is an interrupted fuscous line ; cilia brownish ; posterior wings fuscous, cilia paler, shining, with a dark line at the base.

" I have a specimen of this very distinct species, which a little resembles the foregoing [*pinguis*] which I took at Darenth Wood in June many years since, and another found at Ripley in 1827."—Illustr. Haust., iv., p. 307.

With this description of *hostilis* Dr. Wood's specimen agrees most accurately.

and the general resemblance to *pinguis* is striking, especially in the *breadth* of the fore-wings, while it actually bears no resemblance to the narrow winged *adelphella*. The "ferruginous" basal space in the first is nothing like the brick-red blotch of the other, and the blackish fascia by which it is bounded is comparatively upright in the former, while it is curved and very oblique in the latter.

I am, therefore, perfectly satisfied that *hostilis*, Stephens, is altogether distinct from *adelphella* of Zeller, and probably of F. v. R., and I think, then, there is no reason to suppose that it has ever been found in the United Kingdom. Dr. Wocke (who adopts *hostilis* as the prior name, and *adelphella* as a synonym) gives Britain, Germany, and Southern and Eastern Russia as localities. The former refers to *hostilis*, the latter doubtless to *adelphella*.—C. G. BARRETT.]

ON PARTHENOGENESIS IN *TENTHREDINIDÆ*.

BY J. E. FLETCHER.

During the past season I have, as opportunity offered, continued my experiments on this subject. Thirteen virgin ♀ belonging to six species were tried, but the names of two of the species are not yet determined. They all have the power of depositing fertile ova. I notice that the virgin ♀ of the green *Nemati* deposit only a small number of eggs. So far, I have bred only one ♀ from any parthenogenetic brood of saw-fly larvæ.

A virgin ♀ of *Phyllotoma vagans* deposited between sixty and seventy eggs, but as they were distributed on only three leaves, the larvæ could not feed up. They ate all the parenchyma, and some bored down the footstalks, but then, of necessity, perished. One leaf contained nearly forty larvæ.

A specimen of *Eriocampa ovata*, from a this year's larva, emerged on August 30th; she deposited about thirty ova, from which the larvæ hatched and fed, but not vigorously, till the food plant began to lose its vitality. Eventually, all perished for lack of food.

A specimen of *Hemichroa rufa*, bred August 15th, deposited ova, from which I obtained about forty larvæ; but the stormy weather of autumn proved very unfavourable to larvæ confined in a net, and when I decided to feed them indoors, they were reduced to about twenty, about a dozen of which have spun up.

A small brood of larvæ from a virgin ♀ of *Nematus curtispina*, bred August 17th, spun up by September 20th, and three ♂ were bred by September 30th.

Happy Land, Worcester:
November, 1880.

NOTES ON THE ENTOMOLOGY OF PORTUGAL.
III. LEPIDOPTERA.

BY DR. O. STAUDINGER.

The *Macro-Lepidoptera* collected by the Rev. A. E. Eaton in 1880 are represented by 44 good species of *Rhopalocera*, and 26 of *Heterocera*, 23 of the latter being *Geometra*.

RHOPALOCERA.

PAPILIONIDÆ.

Papilio Podalirius, L., var. *Feisthamelii*, Dup.—A solitary bad specimen, captured April 29th, along the main stream below Cintra.

Thais Rumina, L.—A single specimen, with no indication of date or locality of capture.

PIERIDÆ.

Pieris brassicae, L.—May 17th, near Silves.

Pieris napi, L.—April 27th, near Cintra, and June 8th at Cea.

Pieris Daplidice, L.—One indifferent specimen, captured June 3rd, between Coimbra and São Antonio.

Anthocharis Belemia, Esper, var. *Glauce*, Hüb.—One specimen, May 8th, near Almodovar.

Anthocharis cardamines, L.—One specimen, April 29th, along the main stream below Cintra.

Leucophasia sinapis, L.—One specimen, April 27th, near Cintra.

Colias Edusa, Fab.—One specimen, May 18th, between Silves and Monchique. A specimen of the aberration *Helice*, Hüb., June 4th, near Cea.

Rhodocera rhamni, L.—Several specimens, April 29th, near Cintra, and June 9th, between Cea and São Romão.

Rhodocera Cleopatra, L.—One specimen, May 17th, near Silves.

LYCÆNIDÆ.

Thecla spini, Schiffermiller.—Two specimens, May 17th, near Silves.

Thecla ilicis, Esper, var. *Esculi*, Hüb.—Two specimens, May 17th, near Silves.

Thecla roboris, Esper.—Two specimens, June 12th, at Ponte de Morcellos.

Thecla rubi, L.—A single very worn specimen, with no indication of date or locality.

Polyommatus Alciphron, Rottenberg, var. *Gordius*, Sulzer.—One specimen, June 22nd, near Villa Real.

Polyommatus Phlæas, L.—Several specimens at Cintra, end of April and May 13th, between São Barnabe and São Bartholomeu do Messines.

Lycæna Bætica, L.—One bad specimen, June 6th, at Cea.

Lycæna Telicanus, Lang.—One specimen, June 8th, at Cea.

Lycæna Ægon, Schiffermiller.—Several specimens, June 3rd, between Coimbra and São Antonio; June 8th, at Cea; and June 14th, near Ponte de Morcellos.

Lycæna Icarus, Rottenberg (*Alexis*).—Several specimens at Cintra, end of April; one specimen of the aberration *Icarinus*, Scriba, April 28th, near Cintra.

Lycæna Bellargus, Rottenberg.—One specimen in very poor condition, May 22nd, near Alferce.

Lycæna Argiolus, L.—One specimen, April 29th, near Cintra.

Lycæna semiargus, Rottenberg (*Acis*).—One specimen, June 5th, near São Romão.

Lycæna melanops, Boisduval.—Two specimens, June 25th, near Villa Real.

NYMPHALIDÆ.

Vanessa c-album, L.—One specimen, June 3rd, between Coimbra and São Antonio.

Melitæa aurinia, Rottenberg (*Artemis*), var. *Desfontainii*, Godart.—Several specimens, April 28th, near Cintra; May 19th, near Monchique; June 5th, near São Romão; and June 8th, near Cea.

Melitæa Phæbe, Knoch, var. *occitanica*, Staudinger.—Several specimens, June 24th, near Villa Real.

Melitæa didyma, Ochsenh., var. *occidentalis*, Staudinger.—Several specimens, June 13th, at Ponte de Morcellos, and June 23rd, near Villa Real.

SATYRIDÆ.

Melanargia Lachesis, Hüb.—Several specimens, June 14th, near Ponte de Morcellos.

Melanargia Ines, Hoffmansegg.—Several specimens, May 18th, near Monchique, and June 3rd, between Coimbra and São Antonio.

Satyrus Semele, L.—One specimen, June 30th, near Salamonde.

Pararge Megæra, L.—Two specimens, April 27th, near Cintra, and June 7th, near Sabugueiro.

Pararge Ægeria, L.—Several specimens, April 28th, near Cintra, and June 3rd, between Coimbra and São Antonio.

Epinephile Janira, L.—Several specimens, June 14th, near Ponte de Morcellos; of the variety *Hispulla*, Hüb., several were captured May 15th and 17th, near Silves.

Epinephile Ida, Esper.—Five specimens, June 12th, near Ponte de Morcellos.

Epinephile Pasiphaë, Esper.—Several specimens, May 18th, near Monchique, and June 3rd, between Coimbra and São Antonio.

Cænonympha pamphilus, L.—Two specimens, May 5th, between Casevel and Almodovar, and May 21st, near Monchique. They are a dark variety, but not the *var. Lyllus*, Esper.

HESPERIDÆ.

Spilothyrsus alcea, Esper.—One specimen, June 7th, near Sabugueiro.

Syrichthus Proto, Esper.—One specimen, May 17th, near Silves.

Syrichthus Alveus, Hüb., *var. onopordi*, Ramb.—One specimen, May 17th, near Silves.

Syrichthus Sao, Hüb., *var. Eucrate*, Ochsenh.—Two specimens, end of April, near Cintra.

Hesperia lineola, Ochsenh.—Two specimens, a male, June 3rd, between Coimbra and São Antonio, a female, June 24th, near Villa Real.

HETEROCERA.

SPHINGES.

SESIIDÆ.

Sesia affinis, Staudinger.—Two specimens, June 24th, near Villa Real.

BOMBYCES.

ARCTIIDÆ.

Euchelia jacobææ, L.—One specimen, much wasted, May 23rd, near São Marcos da Serra.

NOCTUÆ.

Euclidia glyphica, L.—One specimen, much worn, June 7th, near Sabugueiro.

GEOMETRÆ.

Nemoria porrinata, Zeller.—One specimen, June 30th, near Salamonde.

Acidalia camparia, H.-S.—One specimen, April 24th, near Olivaes, in the vicinity of Lisbon.

Acidalia nexata, Hüb.—Two specimens, May 10th, near Almodovar.

Acidalia virgularia, Hüb.—One specimen, April 23rd, near Lisbon, one, June 12th, near Ponte de Morcellos.

Acidalia rubiginata, Hufn. (*rubricata*) var. ?—One specimen, in bad condition, is perhaps referable to this species; captured June 25th, near Villa Real. I have not seen this insect from Spain.

Zonosoma pupillaria, Hüb.—One specimen, May 16th, near Silves.

Pellonia sicanaria, Zeller.—Several specimens, June 3rd, between Coimbra and São Antonio.

Hemerophila nycthemeraria, H.-G.—One specimen, May 23rd, near São Marcos da Serra. This species was previously only known from Switzerland.

Boarmia gemmaria, Brahm (*rhomboidaria*).—One specimen, May 20th, on the slopes of Picota, near Monchique.

Gnophos respersaria, Hüb.—One specimen, May 16th, near Silves.

Gnophos asperaria, Hüb., ab. *pityata*, Rambur.—One specimen, June 12th, near Ponte de Morcellos.

Anthometra plumularia, Boisd.—One specimen, June 12th, near Ponte de Morcellos.

Fidonia famula, Esper.—One specimen, June 9th, between Cea and São Romão.

Athroolopha pennigeraria, Hüb.—One specimen, June 30th, near Salamonde.

Halia vincularia, Hüb.—One specimen, June 12th, near Ponte de Morcellos.

Halia gesticularia, Hüb.—One specimen, early in May, at Almodovar.

Aspilates ochrearia, Rossi (*citraria*).—Two specimens, May 8th, at Almodovar, and May 20th, on the slopes of Picota, near Monchique.

Lythria sanguinaria, Duponch.—One specimen, June 24th, near Villa Real.

Ortholitha limitata, Scop. (*mensuraria*).—One specimen, June 14th, near Ponte de Morcellos.

Cidaria bilineata, L.—One specimen, June 3rd, between Coimbra and São Antonio.

Eupithecia oblongata, Thunberg (*centaureata*).—One specimen, June 11th, near Cea.

Eupithecia pumilata, Hüb.—One specimen, April 27th, Cintra.

N.B.—There is one other specimen of the genus *Eupithecia*, but in too bad condition to be determined; it was taken May 10th, near Aldea do Neves.

Blasewitz, Dresden:
1st November, 1880.

AUSTRALIAN GALL-MAKING LEPIDOPTEROUS LARVÆ.

BY E. MEYRICK.

In relation to the subject of Mr. McLachlan's paper in the December number of this Magazine, I may add, that I have found at least three Lepidopterous gall-producing larvæ in Australia, as follows :

1. Larvæ producing a terminal gall on the extremity of the shoots of an *Eucalyptus*, near Sydney ; this gall is an inch or more in length, and has all the appearance of an inflated but unexpanded tuft of leaves, but is a true gall ; these larvæ are solitary ; they produced a species of *Tortricidæ*, at present undescribed.

2. Larvæ producing a swollen gall in the stem of young shoots of an *Eucalyptus*, near Sydney ; these I have not yet bred.

3. Larvæ producing a large shapeless roundish gall on a phyllo-dineous *Acacia*, near Brisbane ; this gall is sometimes as large as two fists, and contains numerous larvæ, becoming riddled with galleries ; it may be taken to represent a cluster of leaves ; these larvæ produced one of the *Pyrilidina*, described by Walker as *Pyralis ægusalis*, though it appears to belong rather to the *Botydæ*. It is distressing that Walker should not have been able to produce a less abnormally compounded specific name.

Ramsbury, Hungerford :
December 7th, 1880.

An addition to the British Trichoptera.—At the last Meeting of the Glasgow Natural History Society, I exhibited specimens of *Molanna palpata*, McLach., a species of caddis-fly new to Britain. It has hitherto been known only from Finland and Siberia, and a specimen from St. Petersburg was found among Kolenati's types of *M. angustata* in the Vienna Museum.

The remarkable form of the third joint of the maxillary palpi in both sexes, at once distinguishes it from its congeners.

The above species was taken during my stay last summer at Cannich, Strathglass, Inverness-shire, and occurred commonly all through August ; it was the common caddis-fly at all parts of the Strath visited by me.

I found it along the margins of lochs by brushing the overhanging heather, &c., and cannot remember having seen it flying without having been disturbed.

M. angustata, Curtis, is the only other British species of the genus.—JAMES J. KING, 267, Sauchiehall Street, Glasgow : December, 1880.

Abundance of Clothilla picea, Motsch.—Mr. E. A. Butler of Hastings, has just sent me a supply of this curious little black species of *Procida*. He says they have been familiar to him for years, as occurring in neglected boxes. Now he finds them chiefly in an old collection of plants that had fallen into decay, and in some marine specimens that had not been properly cleaned. The insects are of varying sizes, and

some of them possess wing-scales, indicating complete development. I had previously seen only single examples, and generally they came from boxes of foreign insects. The boxes in which they came (alive) to me have been committed to the flames, so as to avoid a possible addition to the Fauna of my collections.—R. McLACHLAN, Lewisham: November 27th, 1880.

On the metamorphoses of Blepharoceridæ.—As an addition to Baron Osten-Sacken's communication (*ante* p. 130) on Dr. Fritz Müller's discovery of the metamorphoses of *Blepharoceridæ*, I beg to call the attention of Dipterologists to my report on the same subject in Carus's Zoologischer Anzeiger, No. 51, April, 1880, p. 134. It treats on the metamorphoses of the European *Blepharocera fasciata*, both sexes of which, according to Prof. Mik's discovery of the ♂, have the eyes close to each other, of which Baron Osten-Sacken convinced himself at Vienna, but has forgotten to point it out in his notice.—F. BRAUER, Vienna: Nov. 27th, 1880.

A colony of Plinella denticollis in Warwickshire.—A short time ago I found an example of the rather uncommon *Plinella denticollis*, at Solihull near here, and which was kindly determined for me by the Rev. A. Matthews. This led me to engage in a systematic hunt for the species, in which I have been very successful. Under dead bark at Knowle, I recently discovered quite a large colony of this little beetle, some two hundred specimens of which I have captured without apparently diminishing their numbers. Both males and females occurred, the latter being, as usual, the least abundant.—W. G. BLATCH, Green Lane, Smallheath, near Birmingham: November 20th, 1880.

Capture of Sitaris muralis in the nest of Bombus terrestris.—In August last in a nest of *Bombus terrestris*, having its entrance in a wall supporting the earth on one side of a road, cut in the side of a hill, near Woodchester Park, Gloucester, I found an imago of *Sitaris muralis*. As there were also several strange looking larvæ in the nest I took it home, unfortunately I was unable to watch them, and only one other *Sitaris* developed, the others all died.—H. SEBASTIAN B. GATES, Dominican Priory, Woodchester: December, 1880.

Larvæ of Acronycta alni at Bristol.—It may be interesting to some of your readers to know, that about the second week of July last, I found two larvæ of *Acronycta alni* in our garden, on some French beans, but I have little doubt that they fell from an apple tree that overhung the beans. One was in very good condition, fresh and beautifully coloured; the other had several of the horsehair-like appendages broken off; and the stripes on each segment, instead of being (as in the other) yellow, were a dingy white. The first died soon after I captured it (neither of them fed while I had them), but the other changed to pupa, and is I think free from ichneumon.—PHILIP GRAY, 20, Arley Hill, Bristol: December 4th, 1880.

P.S.—This species, I am given to understand, has been found before in Bristol, but very rarely.—P. G.

An additional food-plant for Laverna epilobiella, Römer.—In July last, I met with four larvæ of this insect feeding on *Epilobium montanum*. One moth was bred in the beginning of August: the others, having escaped or died.—J. E. FLETCHER, Happy Land, Worcester: November, 1880.

Unseasonable weather: Lepidoptera in December.—After some sharp weather in November (sent doubtless for the benefit of the Geraniums and Tropæolums in the garden), we are having, in Pembrokeshire, what can only jocularly be called winter.

On the 3rd inst., when starting on a journey in the morning twilight, a moth came fluttering down from the trees and alighted on the ground. It proved to be *Cidaria russata* in perfect condition—evidently just emerged—but sufficiently smaller than usual to prove it a third-brood specimen, forced by the mildness of the season. On the 4th, *Vanessa urticae* was flying briskly along the streets and over the houses at Pembroke Dock, and on the night of the 5th, *Scopula ferrugalis* came to light at my window. All these were casually noticed, without any attempt at collecting or searching.—CHARLES G. BARRETT, Pembroke: December 9th, 1880.

Reviews.

AVIS PRÉLIMINAIRE D'UNE NOUVELLE CLASSIFICATION DE LA FAMILLE DES DYTISCIDÆ, par D. SHARP. Extrait des Comptes-rendus de la Société Entomologique de Belgique, Séance du 4 Septembre, 1880. Bruxelles: 8vo, pp. 5.

We have received from our old and valued correspondent, Dr. Sharp, a copy of this important outline of the scheme of the larger work upon *Dytiscidæ* on which he has been occupied for some six years; and we willingly give it all the publicity in our power, though regretting that such original matter by a British writer should not have, in the first instance, found a place in some English publication.

This outline is constructed somewhat on the plan of inverting the usually accepted arrangement of things, which the author originally adopted in a discussion of the terms genus and species; and ordinary readers will, by turning to the last page, obtain a readier view of the larger aims of the author.

The great family of *Dytiscidæ* is divided into two series: the first, *Dytisci fragmentati*,—the second, *Dytisci complicati*. No precise explanation is given for these terms, but corresponding series are stated to occur in the *Carabidæ*, the first of which is equally "fragmentary," both "fragmentary" series having in common the same structure of the articulating cavities of the intermediate legs, the outer side of which is composed by parts of three principal pieces of the skeleton. But the *Carabici complicati* and *Dytisci complicati* are opposed to the two "fragmentary and central" series in the fact of only two pieces forming the outer edge of the intermediate cotyloid cavity in the former, whilst four pieces contribute to its formation in the latter. And the *Dytisci complicati* are distinguished from all other beetles by their metathoracic episternum penetrating to the intermediate cotyloid cavity.

Following Thomson and Le Conte, the *Halipilidæ* are excluded altogether, and it is left for students of *Carabidæ* to decide if they are to be ranged in the latter group or form a separate one. *Pelobius* is only admitted by conventional right; it is intermediate between the *Carabidæ* and *Dytiscidæ*, with a predominance of the external structure of the former, and is put at the head of the latter, but with no hint of any group for its reception. The DYTISCI FRAGMENTATI are composed of (presumably) *Pelobius*; a tribe *Noterides*, composed of two genera, *Notomicrus* and *Hydroceptus*, and also of three groups, *Noterini*, *Suphisini*, and *Hydrocanthini* (which three are formed of the genera *Pronoterus*, *Synchortus*, *Noterus*, *Colpius*).

Suphis, *Canthyrus*, and *Hydrocanthus*); and two other groups, *Vatellini* (gen. *Macrovatellus*, *Vatellus*, and *Derovatellus*) and *Laccophilini* (gen. *Laccophilus* and *Neptosternus*).

The DYTISCI COMPLICATI are composed of two isolated and separate genera, three tribes, and two groups. They commence with *Amphizoa* (so that the family character of the possession of natatorial legs must be set aside), followed by the tribe *Hydroporides*, made up of three groups, *Hydrovatini* (gen. *Hydrovatus* and *Queda*), *Bidessini* (gen. *Heterhydrus*, *Pachydrus*, *Desmopachria*, *Bidessus*, "*Huxelhydrus*," and *Tyndalhydrus*), and *Hyphydrini* (gen. *Andex*, *Hydropeplus*, *Primospes*, *Cælydrus*, *Darwinhydrus*, and *Hyphydrus*); an isolated genus, *Sternopriscus*; another group, *Hydroporini* (gen. *Hyphoporus*, *Paroster*, *Herophydrus*, *Cælambus*, *Chostonectes*, *Antiporus*, *Necterosoma*, *Macroporus*, *Deronectes*, and *Hydroporus*); and another isolated genus, *Celina*. Between the tribe *Hydroporides* and the next tribe, *Colymbetides*, intervenes another isolated genus, *Methles*. The *Colymbetides* are composed of the groups *Agabini* (gen. *Hydrotrupes*, *Metronectes*, *Agabus*, *Ilybiosoma*, *Platynectes*, *Leuronectes*, *Agametrus*, *Agabinus*, *Platambus*, and *Ilybius*) and *Colymbetini* (gen. *Scutopterus*, *Rhantus*, *Colymbetes*, and *Meladema*), between which are placed the following seven genera, distinguished from both of them by negative characters, insufficient to form a natural separate division, viz., *Copelatus*, *Aglymbus*, *Lacconectus*, *Agabetes*, *Matus*, *Coptotomus*, and *Lancetes*.

Then comes a separate group, *Dytiscini* (gen. *Hyderodes* and *Dytiscus*), followed by a tribe, *Hydaticides*, composed of two groups, *Hydaticini* (gen. *Prodaticus* and *Hydaticus*), and *Thermonectini* (gen. *Aelius*, *Thermonectes*, *Æthionectes*, *Sandracottus*, *Rhantaticus*, and *Graphoderes*), and an isolated genus, *Eretes*. The series concludes with another separate group, *Cybiistrini* (gen. *Spencerhydrus*, *Homœodytes*, *Megadytes*, and *Cybister*).

In this string of names, there is insufficient material to attempt useful criticism. Dr. Sharp's entomological acumen has been proved too often for any one to doubt that his earnest and long continued study has justified the, at first sight, unbalanced arrangement of tribes, genera, groups, &c.; and his book will, doubtless, make all this clear, even to the swallowing of *Amphizoa*, after straining in vain at *Halipilus*. As regards the names themselves, it can only be suggested that some of the new ones are constructed on the principle of language being given us to conceal our thoughts. We are aware, from former communications, that Dr. Sharp does not attribute to the construction of mere words, and such minor things, the importance hitherto bestowed upon them by his predecessors and fellow-workers; and it is more than probable that the most egregious of the horrors that he now proposes are brought forward merely to show his contempt for nomenclators.

THE YOUNG NATURALIST: an illustrated penny weekly Magazine of Natural History; conducted by J. E. ROBSON and S. L. MOSLEY. Huddersfield: Preston Brothers; London: J. Kempster and Co. Vol. i, 1880.

To a certain extent, this periodical is based upon the plan of the "Intelligencer," but extended to all branches of Natural History. It is apparently published both in weekly numbers and monthly parts. We have before us part xii, for November, 1880.

It appears likely to prove very useful, if care be taken not to identify it with a

special class of collectors. The illustrations, although rough, will, no doubt, prove attractive to juveniles, and the editorial "leaders" sometimes contain sound information and advice. The weak point is the careless correcting for the press, especially apparent in the entomological portion. In this, and in some other respects, the conductors should more closely follow the example set by the French Journal, the "Feuille des Jeunes Naturalistes," to which, amongst contemporaries, the "Young Naturalist" offers the greatest amount of resemblance.

THE BUTTERFLIES OF NORTH AMERICA: by W. H. EDWARDS; second series, Part ix. Boston: Houghton, Mifflin, & Co.; London: Trübner & Co. 1880.

This Part entirely concerns three species of *Papilio*, viz.: *P. Oregonia*, Edwards (much like our *Machaon*), formerly considered a variety of *Hippocrates*, but now described and figured as distinct; *P. brevicauda*, Saunders, the perfect insect of which, having been previously figured, is not further alluded to, but there is a most elaborate series of figures of the transformations, with a detailed account of the habits, as observed by Mr. Mead, in Newfoundland; and *P. Bairdii*, Edwards, which recalls *Asterias*, but is much darker. As usual, the letter-press is very full, and the plates are above praise.

Obituary.

Étienne Mulsant.—Another of the "heroes" of our Science has passed away. Étienne Mulsant, the veteran Entomologist of Lyons, died on November 4th, 1880, at the age of 83, having been born on the 2nd March, 1797, at Mornant, Département du Rhône. For the space of half-a-century this distinguished author has occupied a leading place in the Entomological world, his earliest production bearing the date of 1830, and having for its title "Lettres à Julie sur l'Entomologie, suivies d'une description méthodique de la plus grande partie des insectes de France; ornées de planches (15 in number) dessinées et gravées par MM. Louvain et Duménil." 2 vols. 8vo. Lyons and Paris, 1830. In this work the author slightly sketched the characters and habits of the different families of insects (interspersed with fragments of poetry of his own composition), in the shape of a series of letters originally written for the use of the young lady who subsequently became his wife, to whom the work was dedicated, when finished and published after their marriage. This dedication is a fair specimen of his poetical talents, and is here reproduced.

À MA FEMME.

Tandis que loin de ta présence
J'attendais le moment heureux
Ou ta main, promise à mes vœux,
Devait couronner ma constance
Pour charmer ces trop longs instans,
J'aimais de l'Entomologie
À t'enseigner les élémens,
Cette occupation chérie
Enchantait mon cœur et mes goûts;
Aujourd'hui qu'un titre plus doux
À mon âme te rend plus chère
Je devrais, trop heureux époux,
Goûter mon bonheur et me taire;
Mais, tu l'ordonnes, pour te plaire
Je livre au hasard ces récits,

Produits légers de ma jeunesse,
Qui sans effort de ma paresse
Pour toi seul furent écrits
Plus d'un succès leur est promis,
Si dans leur publique existence
Ils retrouvent ta bienveillance
Ton accueil pour moi si flatteur;
Mais si la critique ennemie
Les accable d'un trait vengeur,
À l'oubli consacrant ma vie
Je saurai près de toi, Julie,
Me consoler de sa rigueur.
Qui te connaît, à mon bonheur
Pourrait encore porter envie.

This labour of love, as it may well be called, was followed by a "Cours d'Entomologie réduit en tableaux synoptiques : à l'usage des écoles." Lyons. 8vo. 1833. And five years subsequently appeared the first of a long series of *Memoirs*, chiefly on various families of *Coleoptera*, published from time to time in the "Annales de la Société d'Agriculture" of Lyons: in the "Annales de la Société Linnéenne" of Lyons; and in the "Mémoires de l'Académie des Sciences" of Lyons.

Of these various *Memoirs* and his other works, the list given by Dr. Hagen in his "Bibliotheca Entomologica," up to the year 1861, is not fewer than 148; since which period the number has been greatly increased; the Annual Summaries of Entomological publications in the German "Bericht," and in our own "Zoological Record," rarely failing to announce fresh works by him, associated with M. Rey, and other French Coleopterists. The most important of these detached *Memoirs* are descriptive of the *Coleoptera* of France, occupying thirty-one volumes large 8vo, commencing with the Longicorn beetles in 1839, occupying 304 pages, with 3 plates, and terminating with the 9th volume of the *Brevipennes* or *Brachelytra*, published in 1879. His "Histoire Naturelle des Punaises de France" occupies 3 volumes 8vo. Many of his shorter *Memoirs* were collected together and published separately under the title of "Opuscules Entomologiques," in 14 volumes 8vo; whilst a more extended and general Monograph of the *Coccinellidae*, in 2 large volumes 8vo, was published in 1852 and 1853, under the title "Species des Coléoptères trimères securipalpes." To this work large numbers of exotic species were contributed by Mr. Hope, and the type specimens, bearing the MS. names of the author, now enrich the Collection under my charge at Oxford.

In addition to his Entomological works, M. Mulsant also published an elementary series of works on Natural History, in which he described "les applications de cette science aux diverses connaissances utiles et offrant la réponse aux questions du programme universitaire," devoting one volume to each of the sciences Zoology, Physiology, Geology and Botany. He also published a companion volume of "Lettres à Julie sur l'Ornithologie," in one large volume, with figures; also a beautiful work on Humming-Birds, in which many new species of these lovely creatures were represented with great skill: he likewise found time to publish a charming work, entitled "Souvenirs du mont Pilat et de ses environs," in 2 volumes 8vo, and a number of bibliographical notices of deceased Naturalists in the *Annales* of the Lyons Académie.

M. Mulsant was the President of the Linnean Society of Lyons, Bibliothécaire-adjoint of the fine Library belonging to the University of Lyons; he was also Professor of Natural History, and "Correspondant du Ministère de l'Instruction Publique."—J. O. WESTWOOD.

THE BELGIAN ENTOMOLOGICAL SOCIETY.—The celebration of the 25th Anniversary of this Society took place at Brussels, on the 16th October, when an address was delivered by M. Weinmann, the President, and an instructive sketch of the history and prospects of the Society was read by the Secretary, M. Preudhomme de Borre. Baron de Selys-Longchamps, the first President, to whom the Society owes so much of its success, was unanimously elected Honorary President.

AN ANNOUNCEMENT OF NEW GENERA OF THE EPHEMERIDÆ.

BY THE REV. A. E. EATON, M.A.

Names for some new genera being required in the lettering of plates to illustrate my forthcoming work on the *Ephemeridæ*, I am anxious to establish them. It will be sufficient to characterize the genera concisely, reserving detailed descriptions of them for the contemplated monograph. The admeasurements given in the descriptions of genera, though exact, should, for all practical purposes, be regarded as only approximate: they are only necessary in the absence of illustrations.

ELASSONEURIA, *n. g.*

Allied to *Oligoneuria*. Wing-membrane dull or satin-like; fore-wing with three longitudinal nervures, of which the hinder two are forked, and with a short, free, epinotal prolongation of the membrane at the wing-roots. Caudal setæ of ♀ 3, subequal to one another and about one-third as long as the body. Type, *E. Trimeniana* (in *Oligoneuria*), McLach. Distrib., S. Africa.

SPANIOPHLEBIA, *n. g.*

Allied to *Lachlania*. Wing-membrane clear neutral tint, "shot" with blue; fore-wing with five or six obvious longitudinal nervures, of which the hinder two are forked (the pobrachial deeply so), also with several series of cross-veinlets disposed transversely, and with a short free prolongation of the membrane at the peak of the mesonotum. Fore-tibia of ♂ about as long as the femur; 1st tarsal joint longer than the next. Caudal setæ 2. Type, *S. Trailiæ*, *n. sp.* Distrib., Tropical S. America.

Spaniophlebia Trailiæ, *n. sp.*

Imago, ♂, in spirits, and dried; thorax atropiceous; abdomen sub-piceous, with paler joinings; caudal setæ pitchy-black, with testaceous pilosity; forceps as in *Lachlania*. Neuration black; fore-wing with pobrachial nervure forked before the middle, and with cross-veinlets, as far as the præbrachial nervure only (another species has the furcation at the middle, and more numerous cross-veinlets extending as far as the anal nervure), viz.: about twenty-five in the marginal, two to five in the sub-marginal, one or two in the next area; the sub-costa towards the tip, and the neighbouring cross-veinlets, strongly bordered with dark fuliginous. Legs black with pale margins.

♀ unknown.

Long. corp. 9, al. 10, set. 8 mm.

Hab.: São Paulo, Rio Solimões, September and November (Mus. McLach.).

The other species (from Ecuador) has pubescent ♂ setæ about $2\frac{1}{2}$ times as long as the body.

HOMEONEURIA, n. g.

Akin to *Lachlania*. Wing-membrane as in *Spaniophlebia*. Fore-wing with undivided longitudinal nervures, and no cross-veinlets; three sub-equal caudal setæ, in ♀ about one-fourth as long as the body and glabrous. Type, *H. Salvinia*, *n. sp.* Distrib., Central America.

H. Salvinia, n. sp.

Imago, ♀, dried. Head and thorax above smooth, black; wing-neuration fuscous; legs pale (discoloured); back of abdomen fuscous, with pale joinings, belly pale; setæ black. Long. corp., ♀, 11, al. 11—12, set. 3 mm.

Hab.: Guatemala.

ASTHENOPUS, Etn., = CAMPSURUS, Etn.

JOLIA, n. g.

Allied to *Polymitarcsys*. Median caudal setæ abortive in both sexes. Neuration of the wings rather similar to that of *Polymitarcsys*. Nymph agile, with seven pairs of abdominal trachæal branchiæ of uniform make, each consisting of an obovate membranous lamina, with a fascicle of filaments annexed to its hinder base (almost similar to the trachæal branchiæ of *Heptagenia*). Fore femur and tibia fringed within with dense stiff hair, as in *Oligoneuria* (tarsus slender). Mandibles not prolonged into a tusk; their lobes slender and acute. Caudal setæ natatorial, about seven-tenths as long as the body; the lateral setæ ciliated internally, and the median seta plumose for upwards of half their length, and then tail-pointed. Type, *J. Raselli* (in *Palingenia*), Joly. Distrib., the Garonne, near Toulouse, in September. Drawings and specimens were most kindly transmitted to me by Dr. E. Joly; and I caught three nymphs last August at Toulouse.

RHOENANTHUS, n. g.

Very like *Potamanthus* (restrict.), but with the median caudal seta abortive in both sexes; lateral setæ in ♂ upwards of twice as long as the body (in ♂ *Potamanthus* one and a-half times). Type, *Rh. speciosus*, *n. sp.* Distrib., Lahat.

Rhoënanthus speciosus, n. sp.

Subimago dried. Wings whitish, with most of the cross-veinlets well bordered with sanguineous, excepting those near the inner and terminal margins, where the wing-membrane is more or less tinted with ochraceous.

Imago dried. ♂, mesonotum lutescent or brownish-luteous. Fore-leg pale ochraceous, with the apex of the femur, the base and apex of the tibia, and the tarsal joinings tinged with purple or sanguineous; unguis dissimilar: posterior legs with the tarsal joints very narrowly tipped with sanguineous. Wings vitreous,

many of the cross-veinlets of the fore-wing conspicuously bordered with sanguineous, their borders more or less confluent, so as to form irregular blotches. Abdomen discoloured, varied with sanguineous above; belly ochraceous. Setæ pale ochraceous or whitish, with joinings more or less sanguineous or blackish-sanguineous, with which colour the forceps also are, in some measure, tinged.

The markings of the ♀ are less distinct than those of the ♂.

Long. al., ♂ 11—12, ♀ 16; corp., ♂ 13, ♀ 16; set. ♂ 25 and 1—26, and 1 mm.

Hab.: Lahat (Leyden Mus.).

The professedly temporary groups ranked provisionally with *Leptophlebia* in 1871, may be dealt with as follows:—

A.—Hind-wings somewhat arcuate in front (Trans. Ent. Soc. London, 1871, pl. iv, 20a and 26d). Basal joint of the ♂ forceps many times longer than the remainder taken together.

BLASTURUS, n. g.

Two long caudal setæ, the other abortive; lateral setæ in ♂ about three times, in ♀ about one and a half as long as the body; median seta about one-fifth as long as it. Fore tibia of ♂ scarcely longer than the femur, the tarsus about one and three-sevenths as long as the femur; unguis of posterior tarsi dissimilar. Type, *B. cupidus* (in *Ephemera*), Say. Syn., *Leptophlebia*, ser. 4, Etn., 1871. Distrib., Temperate N. America.

LEPTOPHLEBIA, Westw. (restrict.).

Three long, sub-equal caudal setæ; lateral setæ of ♂ about one and a half times as long; of ♀ nearly the same length as the body. Fore tibia of ♂ scarcely longer than the femur, but the tarsus nearly one and a half times as long as it; unguis of hinder tarsi dissimilar. Nymph with seven pairs of double tracheal branchiæ, each one bipartite with subulate divisions distantly beset with minute hairs. Type, *L. marginata*, Lin. Syn., *Leptophlebia*, ser. 3, Etn., 1871. Distrib., Northern Temperate Regions.

ATALOPHLEBIA, n. g.

Three long, sub-equal caudal setæ (or in individual specimens sometimes only two), in the ♂ usually twice as long as the body. Normal species: fore tibia of ♂ about one and a half times as long as the femur (in ♀ scarcely longer than it), and the tarsus about one and four-elevenths as long as the femur. Hind tarsus about half as long as the hind tibia; its unguis alike in shape, uncinatæ. Exceptional species: some Cingalese species have setæ three times as long as the body, the ♂ fore tarsus one and three-sevenths as long as

the femur, and the hind tarsus three-thirteenths as long as the hind tibia. Type, *A. australis* (in *Ephemera*), Walk. Syn., *Leptophlebia*, ser. 1, Etn., 1871 (exclusive of the last two reputed species). Distrib., S. Africa, Ceylon, Australasia, Japan, and S. America.

B.—Anterior margin of hind-wing suddenly refracted before the apex, somewhat as in fig. 24*b*, of Trans. Ent. Soc. Lond., 1871, pl. iv.

ADENOPHLEBIA, *n. g.*

Three long, sub-equal caudal setæ, in ♂ about twice as long as the body. Fore tibia of ♂ about one and one-sixth as long as the femur, the tarsus about one and one-fourth as long as the same; hind leg about one and a half as long as the intermediate leg; hind tarsus little over one-third as long as the hind tibia; unguis of the hinder tarsi alike in form, uncinat. Proximal joint of ♂ forceps' limb far longer than the rest put together. Type, *A. dislocans* (in *Ephemera*), Walker, the ♀ of *L. auriculata*, Etn., 1871. Syn., *Leptophlebia*, ser. 1 (part), and *idem*, ser. 2 (*L. colombiæ*, Walk.), Etn., 1871. Distrib., S. Africa; and apparently many Malay and Tropical American species belong here.

CHOROTERPES, *n. g.*

Three long, sub-equal caudal setæ; lateral setæ of ♂ about one and one-fifth as long as the body. Fore tibia of ♂ about one and eight-thirteenths as long as the femur, the tarsus about one and a half as long as the same; hind leg about one and five-thirteenths as long as the intermediate leg; hind tarsus nearly two-fifths as long as the hind tibia; hinder unguis dissimilar in form and size. Proximal joint of ♂ forceps' limb short, the next joint by far the longest (somewhat as in *Ephemerella*). Nymph latent, with seven pairs of foliaceous abdominal tracheal branchiæ, sparsely and very minutely hairy along their edges; 1st pair single, the blade entire, linear lanceolate, and acuminate; the remainder double, both divisions of each nearly alike, ovate, acute, proliferous or else deeply incised on both sides at the base of the produced points, and obliquely sub-cordate at the base. Type, *Ch. lusitanica*, *n. sp.* Distrib., Portugal; and, perhaps, *De Geer's Ephemera vespertina*, L. (though its gills are not proliferous nor auricled), indigenous to Scandinavia, may belong here.

The sub-imago rests with the outer caudal setæ divergent, the fore legs raised, so as to protect the tibia and tarsus, and held apart.

CHOROTERPES LUSITANICA, *n. sp.*

Sub-imago. Wings purplish-black throughout. Legs and setæ dark piceous; tibiæ and tarsi at first reddish-piceous.

Imago, v. v. s. Oculi strongly ascalaphoid, the upper part obscurely tinged with liver-colour; rest of head, and the thorax, black, polished. Legs blackish-piceous, the fore tarsi scarcely paler; but the hinder tibiæ and tarsi distinctly reddish-piceous, the latter being rather the darker. Wings vitreous, with a somewhat talcose gloss, the fore-wing tinged with blackish in the marginal and sub-marginal areas, the base of the costa somewhat testaceous, and the rest of the neuration piceous; cross-veinlets, in the coloured areas, numerous, viz.: in marginal area, six before, and about sixteen irregularly anastomosing beyond, the nodal point; in sub-marginal area, three before, and nine beyond, that point. Abdomen blackish-piceous, with pale rufescent joinings; beneath, the last segment but one is distinctly, and a few of the next preceding it are faintly, tinged with rufescent posteriorly. Forceps within and towards the tips rufescent. Penis and setæ blackish-piceous.

Long. corp., ♂, 10; al., ♂, 10; set., ♂ im., 12, sub-im., 9 and 12 mm.

Hab.: in the stream near Aldea de Neuves, Alemtejo, and near São Marcos da Serra.

C.—Anterior margin of the hind-wing deeply sinuated before the apex (compare Trans. Ent. Soc. London, 1871, pl. v, 2 ♂).

THRAULUS, *n. g.*

Three long, sub-equal caudal setæ (mutilated). Fore tibia of ♂ about one and ten-thirteenths as long as the femur, the tarsus about the same length as this last; hind leg about one and one-twelfth as long as the intermediate leg; hind tarsus almost half as long as the hind tibia; unguis of hinder tarsi dissimilar in form and size. Proximal joint of ♂ forceps' limb by far the longest. Nymph latent, with seven pairs of double tracheal branchiæ; the divisions of each of them alike in form, but those of the 1st pair filiform, simple, and minutely hairy, whilst the divisions of each of the others are foliaceous, oblong-ovate, fringed with long, simple, filiform processes. Type, *Thraululus bellus*, *n. sp.* Distrib., Portugal (and, perhaps, W. Indies).

Thraululus bellus, *n. sp.*

Sub-imago. Wings pale blackish.

Imago (living). ♂. Oculi fuliginose. Body blackish-piceous; the thorax deep black above, glossy, and with the sutures pale. Fore tarsi blackish, the hinder tibiæ and tarsi paler.

Long. corp., ♂, 8; ♀, 7 mm.

Hab.: in the stream below Cintra.

HABROPHLEBIA, *n. g.*

Three long, sub-equal caudal setæ, about thrice as long as the body in both sexes. Fore tibia of ♂ about one and one-third as long as the femur, the tarsus about one and a half as long as the same; hind leg scarcely longer than the intermediate leg; hind tarsus about one-fourth as long as the tibia; unguis of hinder tarsi alike in form.

uncinate. Proximal joint of ♂ forceps' limb sub-equal in length to the rest put together. Nymph latent, with seven pairs of abdominal tracheal branchiæ, all nearly alike in form; each one bifid into unequal segments, which are divided into slender filaments. Type, *H. fusca* (in *Ephemera*), Curt. Syn., *Leptophlebia*, ser. 5, with *L. Picteti*, Etn., 1871; also misprinted *Halecophlebia* (Etn., MS.), by Rostock, 1880. Distrib., Temperate and Southern Europe. [N.B.—The citation here given of *L. Picteti* is based upon recollection only.]

As I have suggested (in private correspondence) the possibility of Dr. Joly's *Cænis maxima* nymph being the young of a *Tricorythus*, I take the opportunity of stating that (judging from specimens in a better condition of preservation than those upon which I relied in the first instance), it is, after all, more likely to be a real *Cænis*. The examples previously examined by me, were all of them defective.

CALLIBÆTIS, *n. g.*

Allied to *Baëtis*. Two long caudal setæ, in ♂ two and a half times, in ♀ twice as long as the body. Fore-wing with several cross-veinlets in the marginal area before the nodus, in both sexes, and with single (if any) interneural veinlets at the terminal margin. Hind-wing tri-nervate, with several cross-veinlets, and with the costal shoulder very obtusely rounded off (compare Trans. Ent. Soc. London, 1871, pl. v, 27—29). Fore tibiæ in ♂ about one and one-sixth, in ♀ three-quarters, as long as the femur; the tarsus in ♂ about as long as, in ♀ about two-thirds as long as, the tibia, the 3rd joint in ♂ shorter than the 2nd joint. Type, *C. pictus* (in *Baëtis* formerly), Etn. Distrib., North and Central America and Australia.

BAËTIS, *Leach* (restricted).

Two long caudal setæ, in ♂ two to two and a half, in ♀ one and one-fourth to two and a half, times as long as the body. Fore-wing without cross-veinlets in the marginal area before the nodus (as a rule, almost without an exception) in both sexes, and with interneural veinlets in pairs at the terminal margin. Hind-wing bi-, or tri-nervate (the intermediate nervure in the latter case sometimes forked), and, generally speaking, destitute of cross-veinlets; usually oblong-ovate, with an acute costal projection, seldom (*B. atrebatinus*) without any costal shoulder at all (compare Trans. Ent. Soc. London, 1871, pl. v, 16 a to 26 a). Fore tibia in ♂ about one and one-third times as long, in ♀ the same length as the femur; fore tarsus in ♂ about one and a

half, in ♀ about three-fifths, as long as the femur, the 3rd joint in ♂ as long as the 2nd. Nymph agile, with seven pairs of single abdominal tracheal branchiæ, all nearly alike in form, viz.: obtusely ovate or obovate, and traversed lengthwise by a pinnately branched trachea, irregularly subdivided. The median seta is usually about three-eighths as long, the lateral setæ about three-fourths as long as the body; but sometimes (*e. g.*, in *B. amnicus*) the median seta is far more abbreviated. Type, *B. binoculatas*, L. Distrib., Europe and Egypt, Indo-Malay region, Australia; North, Central, and, perhaps, South America.

Some species of *Callibætis* and *Baëtis* have the front border of the anterior wings variegated in one or in both of the sexes.

(To be continued).

DESCRIPTION OF ANOTHER NEW SPECIES OF *DAMASTER*.

BY GEORGE LEWIS.

I have now from the West Coast an insular species of *Damaster* which is very interesting to me, as the head and thorax show considerable divergence from the form usual in the genus. The insect comes from the island of Sado, where it appears to be rare, four specimens only being obtainable last month, and these came from the mountains eight miles from the coast. I characterize it as:

DAMASTER CAPITO, *sp. n.*

Nigro-violaceus, corpore vix lato, capite prothoraceque latioribus, validis, oculis subprominulis; elytris granulosis, haud mucronatis.

Hab. in ins. Sado.

Long. corp. 18—19 lin.

Head and thorax violet-black, elytra dull black; more robust in figure than *D. pandurus*, with shorter legs, more robust tarsi, head, mandibles and thorax much larger. The thickness of the head gives the region of the eyes a greater space, and renders them much less prominent, viewed from above they project but little beyond the outline of the head. The thorax is somewhat quadrate, widest in the middle, its greatest breadth equalling its greatest length, which is $2\frac{1}{4}$ lines, and the posterior angles are more acute than in any other described species. The thorax of *D. pandurus* measures, in an average specimen, $3\frac{1}{4}$ lines in width and 4 in length; what *D. capito* loses in length it gains in breadth. Elytra granulose, the striæ as usual scarcely visible.

In speaking of the dilated tarsi in the ♂ of the northern species, as compared to *D. blaptoides*, it must be observed that in *D. rugipennis*, *D. viridipennis*, and the present species, the tarsi are stouter in both sexes, but the difference in the ♂ and ♀ of any one is very little, not more than in the large southern species.

I have now explored North Japan as well as the time at my disposal permits, and I hope next year to give attention again to the south, beginning in Satsuma and then on to Biwa Lake. There seems to me to be good evidence that the large island of Nipon was formerly divided into two parts by the sea running through where the lake now is, and I believe the fauna of the whole of Japan can be apportioned into that of the north and that of the south; the line to be drawn from coast to coast across the Biwa Lake, rather than at any other place where the incursions of the sea at this time seem to indicate a more natural boundary. I have just received from Cape Sova (lat. $45^{\circ} 30'$, the extreme north of Yezo) a ♂ of *rugipennis*, measuring only 13 lines, with copper-coloured thorax instead of the ordinary green, so I am not hopeful of getting a second species in Yezo.

Yokohama: 8th November, 1880.

NOTES ON *CUCUJIDÆ* IN JAPAN, WITH DIAGNOSIS OF A NEW SPECIES.

BY GEORGE LEWIS.

Cucujus Mniszechi, Fairm., is not solely indigenous to Japan, for M. Ancey of Marseilles, has a specimen in his collection from Chefoo, in China. The species was first sent to Europe by two Japanese in a small collection forwarded for the Paris Exhibition of 1877, and the specimens are now in the French National collection and in Count Mniszech's. It is a beautiful blue species and the largest hitherto described, for I find that *C. imperialis* (Ent. Mo. Mag., vol. xv, p. 234) only equals small specimens of it. I took a fine series last June, and the first specimen measured one inch and one line, giving me a most uncomfortable nip with its powerful mandibles when I interfered with its liberty. It breeds in the large oaks which grow freely in the elevated forests of central Nipon,* the imago passing the winter under the bark. Two days since I found a lively pair.

There is a smaller species here, more common, living under bark of various deciduous trees, such as beech and elm, occurring in early summer and again in autumn, and ranging from Yokohama North to South Yezo. I briefly characterize it as:—

CUCUJUS COCCINATUS, *sp. n.*

Elongatus, depressus, niger. Statura omnino O. bicoloris, elytris coccineis, punctulatis, lateribus subcarinatis. L.c., 6—7 lines.

* Same latitude as Chefoo.

Both the Japanese species have the elytral carina less elevated than the Indian, and the punctures on the wing-cases are more distinct in the ♀ than in the ♂.

I have also found *Brontes planatus* here and in Yezo abundantly, both under bark of various kinds and in old houses at night, running on the rafters; and *Dendrophagus* occurs in mountains very sparingly under bark of pine and larch. I believe the latter species is not distinct from *D. crenatus*, which, with the *Brontes*, is in our British List.

Yokohama: October 31st, 1880.

DESCRIPTIONS OF FOUR NEW SPECIES OF *COSSONIDÆ* FROM
THE HAWAIIAN ISLANDS.

BY THE REV. T. BLACKBURN, B.A.

ODEMAS.

O. OLINDÆ, *sp. nov.*

Ovale, sat elongatum, nitidissimum, nigro-æneum ad viridem accedens; rostro elongato, apice fortiter dilatato, confertim punctato; oculis sat magnis, convexis; antennis rostro capite prothoraceque vix brevioribus, funiculi articulis primo et secundo elongatis subæqualibus, clavâ fortiter elongatâ; prothorace antice angustato, fortius nec confertim punctato; elytris antice confuse punctatis, postice obscure carinatis, impunctatis, margine anteriori subelevato, humeris subprominulis; pedibus in primis robustis; subtus abdominis parte anteriori minus fortiter punctatâ. Long. $6\frac{1}{2}$ — $7\frac{1}{2}$ mm.

In dead branches of trees near "Olinda," the property of S. Alexander, Esq., on Haleakala, Maui; named in memory of my hospitable reception at that most agreeable sanatorium.

An extremely distinct species. The long rostrum and antennæ (of which latter the club measures more than half a millimètre), the prominent eyes, the defined front margin of elytra, and their subcarinate hinder portion, combine to produce a facies suggestive even of a distinct genus; but as each of these organs presents similar characters in a less degree in some one or other of the previously described species of *Oodemus* (even the elytral peculiarities being faintly represented in *nivicola*), I think it must take its place with them.

O. INFERNUM, *sp. nov.*

Ovatum, nitidum, æneum ad viridem accedens, antennis rufo-testaceis,

pedibus piceis plus minusve rufescentibus, rostro lato, rugoso-punctato; antennis robustis, rostro capite prothoraceque conjunctis paulo brevioribus, funiculi articulo secundo primo paulo longiore; prothorace fortiter transverso, antice fortiter angustato, parce nec fortiter punctato; elytris haud striatis, seriatim fortiter nec crebre punctatis, interstitiis parce subtilius punctatis; subtus abdominis parte anteriori minus fortiter punctatâ. Long. $4\frac{1}{2}$ — $5\frac{1}{2}$ mm.

In bark; near the crater "Kilauea," on Mauna Loa, Hawaii.

The other described species whose elytra are not distinctly striated are either of elongate form, or having the elytra of the peculiar build which I have called "bisinuate;" *nivicola*, the striation of whose elytra is obscure in one sex, has totally different antennæ.

O. SUBSTRACTUM, *sp. nov.*

Ovatum, nitidum, nigro-aneum ad viridem accedens, antennis rufo-testaceis, pedibus piceis plus minusve rufescentibus; rostro fortiter punctato rugatoque; antennis rostro capite prothoraceque conjunctis paulo brevioribus, funiculi articulis primo et secundo elongatis, hoc illo paulo longiore; prothorace transverso antice angustato, parcus nec fortiter punctato; elytris a latere fortiter bisinuatis, confuse punctatis, aliquot punctis (quæ majora sunt cæteris) seriatim dispositis; subtus abdominis parte anteriori parce fortiter punctatâ.

Long. $4\frac{1}{2}$ — $5\frac{1}{2}$ mm.

Various localities on Haleakala, Maui, up to 4000 feet, but not taken commonly.

I have had specimens of this insect for some time past separated from the other species of the genus, and some doubtfully placed with *O. obscurus*. The addition and examination of fresh specimens this year have, however, led me to regard them all as appertaining to a single somewhat variable species, some examples of which are narrower and more elongate than others, while in some examples the punctuation (especially on the under-side) tends to become extremely confused, and even obscure. The distinctive features of the species appear to be, rather long, stoutish antennæ, with the basal two joints of the funiculus elongate, the 2nd markedly more so than the 1st, and elytra contracted about the middle, so that their outline is of two distinct curves. It is allied to *obscurum*, but differs by its average superior size, strongly sculptured rostrum, non-striate elytra, &c.

Of this, and the preceding species, I have examples in which the rows of punctures run into obscure striæ near the apex, according to a (probably sexual) peculiarity of the genus, previously referred to by me.

ANOTHEORUS.

A. IGNAVUS, *sp. nov.*

Æneo-piceus, antennis pedibusque plus minusve rufescentibus; rostro lato capite longiore, sparsim subtiliter punctato; antennarum funiculi articulo secundo primo vix longiore; prothorace antice fortiter postice plus paulo contracto, crebre fortiter punctato, lateribus rotundatis; elytris subparallelis, convexis, substriatis, striis crebre fortiter punctatis, interstitiis crebre punctatis.

Long. 5½—6 mm.

Haleakala, Maui; in the bark of the "Koa" tree, at an elevation of about 4000 feet.

Easily distinguished from its congener (*A. montanus*) by the strongly rounded outline of its thorax, which is much contracted behind, and the sub-parallel form of its elytra, on which the striæ are very faint, and the punctures in the striæ very fine, as compared with those of *montanus*.

Honolulu: November, 1880.

NOTES ON THE HAIRS OF HYMENOPTERA.

BY EDWARD SAUNDERS, F.L.S.

I published in the Transactions of the Entomological Society of London for 1878 the few observations I had then made on the hairs of our British *Aculeate Hymenoptera*. Since which time I have made a few further notes which I thought might be interesting to some of the readers of the Magazine.

I there observed that the *Melliferæ* or pollen-collecting bees differed from the other sections of the Order in having their hairs branched or plumose, at least on most parts of their body. Now, there are a few *Melliferæ* and Fossorials, &c., which have hairy eyes; and it occurred to me that it would be interesting to see if these very minute hairs which grow between the facets of the eye were also conformable to the rule observed above. I therefore compared the hairs from the eye of *Entomognathus brevis*, one of the fossorials, with those from the eye of a species of *Cælixys*, one of the *Melliferæ*; the result being that the *Entomognathus* hairs appeared quite simple, whereas those of *Cælixys* showed evident indications of branches, see

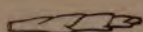


Fig. 1.

fig. 1. I think this experiment is interesting, as it seems to me that a character which is so well sustained, that it exists even in the minute hairs of the eyes, ought to be one of considerable importance.

In the same paper I also drew attention to certain hairs with dilated apices, and sharp apical edges, which occur on the inside of the posterior tibiæ of *Andrena*, and, as far as I have been able to make out, of all the *Melliferæ* (see fig. 2); since then I have discovered, on the inside of the front tibiæ of *Bombus*, a series of hairs, which also have sharp edges, but in these the edge is lateral, and not apical (see fig. 3).



Fig. 2.



Fig. 3.

I think there can be little doubt that both these forms of hairs are useful for cleaning purposes, and that the directions of movement in the front tibiæ are such that they bring the lateral edges of the hairs into use, whereas those of the posterior tibiæ bring the apical edges. I have only as yet found these sharp-edged hairs on the *Melliferæ*, and, therefore, I think it probable that they are in some way specially adapted for the removal of the pollen-grains. A portion of the inner side of the front tibia of a *Bombus*, showing all the knife-like hairs in rows, is a most interesting object for the microscope.

Many Hymenopterists know well the scale-like hairs which clothe the abdominal bands of some of the European species of *Cælixys*, and the thorax of *Andrena squamea*, &c.; these I have examined with a good deal of care, in order to see if I could find anything that could be called a true scale. Those which seem to approach most nearly to it are the scale-like hairs of *Cælixys caudata*, but the scale-like appearance is only caused by the very close proximity of the branches, so that under a strong power the hair looks somewhat like a short fox's brush: in some the midrib is wide, and one can quite imagine that it might become so flattened and wide, as to bear all the branches on its dorsal surface, in which case we should get a hairy scale, but as yet I have found nothing of the sort, except in imagination. Unfortunately, I have very little time for microscopic study, as I am sure that attention to the subject of hairs generally, would repay any one who has the time and opportunity at his disposal.

Holmesdale, Upper Tooting:

4th December, 1880.

ON THE SPECIES OF THE GENUS *ORTHEZIA*.

BY J. W. DOUGLAS.

In my former article (p. 172, *ante*) two items were left in abeyance; on these I have now to offer some observations which, if not altogether conclusive yet, appear to be desirable to record: and I add a few remarks on other names or species in connection with the subject of this paper.

I have not succeeded in getting access to the "Goetheborgska Vetens. Handl.," 1778, which contains Modeer's monograph of *Coccidæ*, and can, therefore, only rely on Gmelin's synopsis of *C. uva*, Mod. (Syst. Nat., 2222, 42, 1788), which is as follows:

"*C. Testa rufa, fusca, sphaerico gibbo, subflavescente. Habitat in Succia sub lapidibus.*"

Now, as the only part of this that can possibly apply to an *Orthezia* is contained in the last two words, I think that Signoret did well to say, with respect to this species, "*Orthezia*?"

In the Mémoires de la Société Linnéenne de Paris, iii, 285—290 (1825), is an article entitled: "Description d'une nouvelle espèce de *Dorthesia* existante aux environs de Paris: par M. Arsenne Thiébaud de Berneaud, Secrétaire perpétuel."

After giving the account of *O. characias* already cited from the "Journal de Physique," the author, at p. 290, continues with respect to his new species *Dorthesia Delavauxii*:

"Il vit sur la face inférieure des feuilles de la germandrée sauvage (*Teucrium scorodonia*). Ses mœurs, ses habitudes et ses mues sont les mêmes que dans l'espèce dite *characias*. La tête, dans l'un et l'autre sexe, est visible, et armée d'un trompe d'un brun roussâtre, à la naissance de laquelle on aperçoit, à la loupe, des yeux bien distincts. Les antennes du mâle, plus longues que le corps, sont composées de neuf articles; celles de la femelle, qui sont très-courtes, n'en présentent que cinq. L'abdomen n'est point strié, mais découpé et comme frangé. Le mâle a en tout 7 millimètres (3 lignes) de long; ses ailes se relèvent à leur extrémité et dépassent d'un tiers la longueur du corps. La femelle est ovoïde et n'a que 5 millimètres (2 lignes); elle est aptère et ne prend point, comme la cochenille, la forme d'une galle après la ponte.

"Sur les feuilles de *Teucrium scorodonia*, j'ai vu en même temps la femelle du *Dorthesia Delavauxii*, les premières enveloppes de la larve et l'insecte nu qui est d'une couleur carmin. J'ai cru y voir aussi la dépouille de la larve d'une coccinelle hexapode,* couverte d'une poussière blanchâtre, qui s'insinue dans le sac ovifère de la femelle, sans lui occasioner de mal, pour y dévorer sa progéniture. En deux ou trois jours cette larve a terminé sa curée, elle sort du sac et va chercher ailleurs d'autres victimes.

* A species of *Scymnus* sec. Burmeister.—J. W. D.

"Pour compléter l'histoire du *Dorthesia Delavauxii*, j'en donne ici la figure dessinée par notre habile confrère M. Theodore Descourtilz. Nous y sommes entrés dans les détails que ne présentent nullement ni les deux figures qui accompagnent les articles consacrés au *Dorthesia characias* dans le journal du célèbre abbé Rozier, ni celle publiée par Degeer (Mém., vii, pl. 44, fig. 26),* et représentant le *Coccus farinosus*, espèce de *Dorthesia* que Modeer a recueillie sur les feuilles sèches du sapin, et qui, mieux observée, fera la troisième espèce du genre dont je viens de vous entretenir."

In the figures of the ♂ the antennæ and wings are not represented of the length described; the head has two projecting lamellæ, and the anterior part of the stout body only has, apparently, large tufts or lamellæ, the sides having four striæ, which may be intended to represent longitudinal lamellæ, for there appear to be posteriorly recurved, conjoined lamellations. The head is both described and figured as having a long rostrum. The ♀ is figured as an oval sac without any imbrication, dorsal or lateral, except anteriorly, and the antennæ are described as having but five joints.

Altogether this insect is an enigma, which Signoret has not attempted to solve, and although he places it as synonymous with *O. urticæ*, some only of the characters are problematically in accordance with this species, while the existence of a long rostrum in the ♂, which is both described and figured, goes to show that the insect is no *Orthezia*, nor any other of the *Coccina*.

Orthezia dispar, Kaltenbach, was never described, so far as I can ascertain; it is given thus by Kaltenbach in "Die Pflanzenfeinde," p. 486 (1874): "*Dorthesia dispar*? = *urticæ*, Brm." It is, therefore, merely a superfluous name.

In the "Natural History Transactions of Northumberland and Durham," iv, 370 (1872), the late Mr. T. J. Bold has the following note:—

"*Dorthesia characias*, Latr., West. Intro., vol. i, frontispiece, fig. 8, ♂; vol. ii, 445, fig. 118, 20, ♀ (*D. cataphracta*). The female of this curious creature was taken in Cold Martin Moss, Wooler, by Mr. Hardy. I once had a bunch of the culms of grass brought to me which had attached to them what might be the egg-bundles of this insect; they were silky-white, about the size and shape of a stout grain of rye, and full of pink-coloured eggs."

Now, it is erroneous to attribute *characias* to Latreille, and also to state that *cataphracta* is the female of that species; further, it is very doubtful if the "egg-bundles" were produced by a *Dorthesia*, for it is not recorded by any observer that any egg-bag of this insect

* This "fig. 26" (erroneously printed "fig. 6" at p. 174 ante) represents *Coccus floccosus*, which De Geer described and figured as a new species communicated to him by Modeer. *Coccus farinosus* is a widely different creature described and figured by De Geer (Mém., vi, 442, 3, pl. 28, fig. 16—22, 1776), and referred by Signoret op. cit., p. 319, to *Gossyparia ulmi*, Geoffr. (1764).—J. W. D.

ever becomes detached. On the contrary, it has been noticed by more than one person (with respect to *O. urticæ*) that the young ones are hatched within the *marsupium*, which is in reality part of the body of the mother, and that they remain there for some time afterwards. Rather, these "egg-bundles" seem to resemble the "silky-white" ones which, on the same page, Mr. Bold ambiguously attributes to *Coccus vitis*, Linn., although they were found on a gooseberry bush in the open air, and only near a vinery.

In his report on the Insecta of the Arctic Expedition of the "Alert" and "Discovery," in the years 1875—76 (Linnean Society's Journal—Zoology, xiv, 118), Mr. McLachlan has this note: "From Disco Mr. Hart brought several examples of the ♀ of *Dorthezia chiton*, Zett., already recorded from Greenland." This refers to Zetterstedt's statement respecting his *D. chiton* (Ins. Lap., p. 314)—"*Varietas antennis pedibusque fusco-testaceis, mihi e Groenlandia benevolentia D. Westermanni quoque communicata.*"

In the "Mittheilungen der schw. ent. Gesells.," vi, 6 (1880), Dr. G. Haller has an article entitled, "Ueber die Larve eines noch unbeschriebenen *Orthezia*-ähnlichen Thieres." The author says that at Leissigen (Lake of Thun) in the moss on old fruit trees, he again and again has found *Orthezia* larvæ of two forms, one of which he identifies with *O. urticæ*, as described and figured by Signoret, the other similar but differing in several respects. The more essential points of divergence are:—the antennæ, which have apparently only four joints, yet the last and longest has indistinct indications of several flagellate articulations blended together (mehreren verschmolzenen Geisselgliedern):—the legs thickly set with many small tubercles (dicht von sehr zahlreichen Höckerchen besetzt):—and the character and form of the particles of the calcareous secretion on the body. The young larva-state only is noticed, but the author deems its specific characters so marked that, anticipating the discovery of the perfect form will confirm his opinion that it will prove to be a distinct species, he proposes it should bear the name of *Orthezia Signoreti*, being evidently unaware that Dr. F. Buchanan White had appropriated the name. It would be curious if, after all, the species in both cases proved to be the same; but with the particulars of the young larva-state only before us, it is scarcely possible to say what the insect really is: yet it should not be difficult to obtain *in loco* some examples in the mature form, and so determine the matter.

DESCRIPTION OF A NEW SPECIES OF *DOLERUS* FROM SCOTLAND.

BY P. CAMERON.

DOLERUS SCOTICUS, n. sp.

Black; the four anterior knees and apex of tibiæ reddish, the red on the middle legs being more obscure than on the front pair. Head, thorax, and apex of abdomen covered with a long white pubescence. Head, pleuræ, and mesonotum distinctly punctured all over. Antennæ nearly as long as the abdomen, scarcely attenuated at the apex. Wings hyaline, costa and stigma black, the latter pale on the under-side. Tegulæ red. ♀. Length, scarcely 4 lines.

Agrees with *D. puncticollis*, Thoms., in the punctured mesonotum, but the puncturation is much more distinct, the body is shorter, the antennæ longer, the abdomen more inflated, the marginal nervure is received further from the 2nd submarginal, the hind legs are entirely black, and the tegulæ red.

Taken at Braemar by Dr. Sharp in June.

Glasgow: 10th January, 1881.

Dimorphism of female Blepharocera.—Since the publication of my article on this subject (p. 130 of this vol.), I received from Dr. F. Müller a very pleasant letter in reply. He says that there can be no doubt about the sex of those females, because they show distinct *receptacula seminis* and eggs; he adds that his paper, containing a detailed description of his observations, will be soon forthcoming. Dr. Müller's discovery thus involves three facts, new to the student of *Blepharocera*: 1, that male and female do not always have the head and the front of the same structure; 2, that some species may have two forms of females; 3, that one of these forms has the organs of the mouth built upon a plan different from the type hitherto described as peculiar to the female. It remains now to be seen, whether some of the European species will not give occasion for similar observations? Dr. Müller adds to his letter a photographic copy of the beautifully-executed plate which will be added to his paper.—C. R. OSTEN-SACKEN, Heidelberg: January, 1881.

Habits of Bombylius (See *ante*, p. 161).—The December number of the "American Entomologist" gives further details about the preying of the larva of *Bombylius* on locust-eggs. The species of the fly was ascertained by breeding, nearly at the same time, by Mr. Lemmon in California, and by the able Editor of the Am. Ent., Mr. C. V. Riley. Two genera were obtained by Mr. Riley: *Systoechus*, a genus also represented in Europe, and occurring principally in dry plains; and *Triodites* (O. S., Western Dipt.), belonging to the group *Lomatina*. It must be borne in mind, however, that the larvæ of *Bombylius* (in the narrower sense) live in the cells of different bees (*Andrena*, *Colletes*, *Halictus*), as has been ascertained by the direct observations of MacLeay (Ann. N. H., 1838), Morelet (Bull. Soc. Ent. Fr., 1845, p. xxiv), Schmidt Goebel (Stett. Ent. Z., 1876, p. 392), and T. A. Chapman (Ent. Mo. Mag., vol. xiv, 1878, p. 196). What remains to be ascertained now, are the early stages of those larvæ, which, as Mr. Riley very acutely remarks (*l. c.*, p.

282), very probably are "much more active than in the later stages and of a somewhat different structure." This results from the fact that the fly performs the act of oviposition in the open air, that is, some distance from the underground-nest of the bee; this act was closely observed by Dr. Chapman; but we have also earlier observations, the earliest being that of Gilbert White (Nat. Hist. of Selborne): "The female (he says) seems to lay its eggs as it poises on its wings, by striking its tail on the ground and against the grass that stands in its way, in a quick manner, for several times together." A similar observation was made by Frauenfeld on the oviposition of *Lomatia* (Verh. Z.-B. Ges., 1864, p. 688). The statements of Zetterstedt (Ins. Lapp., p. 520) and Zeller (Isis, 1840, p. 25), on the oviposition of *Anthrax* differ in the fact that both observers saw the fly insert the end of the abdomen in the soil.—ID.

List of Muscidae Calyptera taken in a greenhouse.—During the month of August one of my greenhouses was entirely taken possession of by an immense swarm of wasps and flies, which devoured almost every grape in it. Perhaps a list of the flies may not be without interest. 1, *Sarcophaga carnaria*, common; 2, *Mesembrina meridiana*, abundant; 3, *Musca vomitoria*, abundant; 4, *M. erythrocephala*, common; 5, *M. Cæsar*, abundant; 6, *M. azurea*, rare; 7, *M. domestica*, abundant; 8, *Pollenia rudis*, abundant; 9, *P. nitens*, common; 10, *P. corvina*, common; 11, *P. sepulchralis*, common; 12, *Cyrtoneura stabulans*, common; 13, *Myospila mediatubunda*, very rare; 14, *Morellia hortorum*, rare; 15, *M. simplex*, common; 16, *M. curvipes*, very rare; 17, *Polieleles lardaria*, abundant; 18, *P. albolineata*, abundant; 19, *Hyetodissa errans*, abundant; 20, *H. erratica*, common; 21, *H. lucorum*, abundant; 22, *H. signata*, rare; 23, *H. umbratica*, abundant; 24, *Hydrophoria anthomyia*, rare; 25, *Mydæa angelica*, common; 26, *Spilogaster quadrum*, rare; 27, *Hylemyia strigosa*, abundant; 28, *H. variata*, common; 29, *Homalomyia canicularis*, abundant; 30, *H. maniculata*, abundant; 31, *H. mutica*, common; 32, *Chortophila rotundicornis*, rare; 33, *C. angustifrons*, rare; 34, *Canosia pacifica*, common; 35, *C. tigrina*, rare; 36, *Mycophaga fungorum*, rare.—C. W. DALE, Glanvilles Wootton: Dec. 2nd, 1880.

Recent captures of Coleoptera in the Forest of Dean.—*Cychrus rostratus* and *Scydmaenus Sparshalli* in the refuse collected about stumps; *Calosoma inquisitor* and *Silpha 4-punctata*, ascending and descending trunks in early summer; on one occasion after a heavy shower the former insect was common under the oaks; *Dromius agilis*, two or three while hibernating; *Pterostichus oblongopunctatus* and *Choleva angustata*, under stones; *Acupalpus exiguus* (var. *luridus*), *Bradycellus harpalinus*, and *Lathrobium terminatum*, freely in a swampy piece of land; *Dinarda Mærkeli*, in nests of *Formica rufa*; *Eusphalerum primulae*, in spring flowers; *Megaconus cingulatus*, under a log; *Prionus coriarius*, on stumps and paths; *Ptinus subpilosus*, on decaying oak; *Trypodendron domesticum*, very common on and in a sound beech stump, and also running on freshly felled timber; *Cassida equestris*, swarming on spear-mint in September; *Carabus arcensis*, *Elatер pomorum*, and traces of *Strangalia 4-fasciata*, in rotten wood; *Ips 4-guttata*, in strong-smelling semifluid fungus attacking oak stumps; *Ips 4-punctata*, in profusion; *Quedius lateralis* and *Philonthus addendus* (?), in fresh stump-fungus, in numbers;

Quedius cruentus, *Leistotrophus murinus*, *Philonthus puella*, *Necrophorus mortuorum*, *Hister succicola* and *Omosita depressa*, in the same, when stale; *Priobium castaneum*, *Acalles ptinoides*, *A. turbatus*, *Cænopsis Waltoni*, *Rhinosimus ruficollis*, and *R. viridipennis*, on holly trunks; *Agathidium nigripenne*, *Ditoma crenata*, *Rhizophagus cribratus*, and *R. politus*, under bark; *Epuræa decem-guttata*, *Cryptarcha strigata*, and *C. imperialis*, at exuding sap; *Aphodius nitidulus*, *A. conspurcatus*, *A. obliteratus*, *A. depressus* commonly, *A. sticticus* (1 example), and *Geotrupes mutator*, in horse and sheep droppings; *Corymbites pectinicornis*, *A. cupreus*, and the var. *æruginosus*, *C. metallicus*, *C. bipustulatus*, *Sericosomus brunneus*, and *Campylus linearis*, flying in the sunshine or at rest on *Pteris aquilina*; *Badister sodalis*, *Oxyptoda soror*, *Megacronus analis*, *Lithocharis brunnea*, *Bythinus Curtisi*, *Cephenium thoracicum*, *Agathidium atrum*, *A. seminulum*, *Strophosomus retusus*, *Sitones cambricus*, *Barynotus mærens*, and *Mniophila muscorum*, by shaking moss; *Elmis Volkmar*, *E. parallelipipedus*, *Telephorus alpinus*, *T. translucidus*, *Phytobius 4-tuberculatus*, *Orobites cyaneus*, *Orchestes ilicis*, *Rhynchites cupreus*, *R. pubescens*, *Liosomus ovatulus* (var. *collaris*), *Polydrusus micans*, *Clythra 4-punctata*, *Lampyrosoma concolor*, *Cryptocephalus moræi*, *Chrysomela varians*, *C. didymata*, *Goniocena pallida*, *Pachyta 8-maculata*, by sweeping.—A. E. HODGSON, Coleford, Gloucester: January, 1881.

Ocyusa picina in Warwickshire.—By stripping the folds of *Typha latifolia* growing in a boggy place not far from Birmingham, I recently captured several specimens of the rare *Ocyusa picina*, Aub. In its company were a few *O. maura*, great numbers of *Anchomenus puellus*, and three or four *Baris T-album*, as well as lots of commoner *Coleoptera*. The severe weather has put a stop to out-door entomologizing for a time, but, as soon as the frost ceases, I purpose searching for more *O. picina*, with the view of supplying any of my correspondents who may be in want of the species.—W. G. BLATCH, Green Lane, Smallheath, Birmingham: January 15th, 1881.

Plegaderus dissectus in Warwickshire.—On the 21st June last a single specimen of *Plegaderus dissectus* occurred to me whilst searching for *Diphyllus lunatus* amongst a fine crop of *Hypoxyton concentricum*, which had sprung out of the decaying trunk of a fallen ash tree in this neighbourhood. Under the bark of the same log I found *Ptinella angustula* and *Euplectus nigricans*, the latter being noteworthy, inasmuch, as until then I had never found *E. nigricans* except under oak bark.—ID.

Extraordinary vitality of Otiorynchus ambiguus.—During a visit to the Isle of Wight in May last, I captured a number of specimens of *Otiorynchus ambiguus*, which I placed in laurel until my return home. I carded the majority of them early in June; but finding fourteen specimens still alive, I put them in fresh laurel in a stoppered glass jar, where they remained until to-day. On taking them out to set them this evening, I was surprised to find that two individuals were still alive, after nearly eight months' close confinement in the poisonous laurel! The fact seems to me sufficiently extraordinary to deserve record.—ID.: January 18th, 1881.

Notes from Japan.—I have now returned overland to Yokohama from Awomori, 500 miles, having got a new *Chlenius* allied to *Noguchii*, a *Bembidium* near *articulatum*, and a single *Miscodera*, very nice, but not quite perfect. I have now done north Japan (getting 680 species new to me), and intend to travel south before January, and work north to the Biwa Lake as spring and summer advance. This year I started northward in the beginning of June, and the *Longicornia* came out in full burst to welcome me until I reached the most northern point, 650 miles from Yokohama, in mid August. I have got all my collection here safe and am packing it for England, for it is a veritable white elephant to me now. The bears troubled me much in the north, for they frightened the collectors, being very numerous this autumn, and came down to the houses for grapes, as food in the hills became scarce. I have only one ♂ of *Carabus Gehini*, the finest here, something between *Damaster* and *C. auratus*. *Euchirus* and *Dicranocephalus* do not turn up.—GEORGE LEWIS, Yokohama: November 3rd, 1880.

Observations on Vanessa in Japan.—In July and August, I observed in South Yezo specimens of *Pieris cratagi*, *Vanessa Antiopa*, *Io*, *cardui*, and *urtice*; and it may interest English entomologists to hear of these insects in Japan. They are all hardy species, but if they flourish even intermittently between this and western Europe, they must at times be liable to many changes of climate and conditions of life, and the larvæ must, I think, feed on different species of allied plants. *V. Io* occurs in Japan as far south as Nambu, but both there and in Yezo there is a nettle which is very irritating to the hand when touched, and if this plant grew further south I should expect to find *Io* with it. But in looking at *Antiopa*, it may be said its food-plant is found down to the south of the Archipelago, yet it does not pass thither, so evidently the climate or some other cause checks it. I have seen *Antiopa* twice in England, the last time when a few years since (1872) so many captures were recorded in the Ent. Mo. Mag., and I think these periodical appearances merely exhibit the ordinary method in which many *Lepidoptera* distribute themselves when in superabundance in one locality; and, were there no special cause preventing it, *Antiopa* would establish itself permanently in England: each one of these flights is an effort to do so. Butterflies fly long distances, and merely crossing the channel from France or Germany is easily accomplished by any butterfly of *Vanessa*-power, and their flight is after all often mere resting on the wind. I have seen specimens of *Papilio* at sea, an hour before land was visible, in fine condition and so vigorous that when approached for capture they have fluttered away and gone off oceanwards, where of course they are finally lost. Now in Japan I have found species occupying a limited area, from there being other animals at hand ready to prey on them. An instance of this is noticeable here, for there is a total absence of the Magpie, which at Shanghai and other places in China is so abundant that any visitor of a few days must notice it, as it is there not in dozens but hundreds, forming quite a feature in the landscape. The cause of their absence here is, I think, the large crow (*Corvus japonicus*) which would destroy their eggs or devour their young, for the latter species plunders everywhere. A short time since a crow took a candle out of the lantern of my Jinrikisha, while I was eating my lunch within a yard of it, and a friend of mine in Osaka has had quail stolen from the frying pan by the same bird. Perhaps the cause of *Antiopa* not establishing

itself in England may be a parallel case to this, the house sparrow, or some other bird, may be fond of the conspicuous larvæ; for I do not think it is out off by climatic causes from our island on account of having reached the limit of its distribution, and the food plant we know is there.

Of the winter of Hakodate I have made some notes elsewhere, and will merely remark that although it is much more severe than any weather ever felt in England, snow remains on the land three or four feet in thickness for two or three months, which protects both vegetation and animal life. Last spring near Fujiyama I took some snow off a mossy log, and putting my hand into the rotten wood felt it quite warm and drew out some half-dozen *Carabi* which had comfortably passed the winter there.—ID.: October, 1880.

Description of the larva of Euclidia glyphica.—On July 2nd, 1878, I received a good supply of eggs, together with the parent moth, of this species from Mr. Blackall, of Folkestone. The eggs were globular, and distinctly ribbed from the summit to the base: when first deposited they were bright pea-green, but soon changed to dull green, with, on the crown, a large brown blotch, and below this blotch a ring of the same colour. They began to hatch on the 10th of the same month, but the young larvæ were not all out before the 13th.

The newly-emerged caterpillar looks large for the size of the egg, being about three-sixteenths of an inch long, is very lively, and when walking arches its back like that of a Geometer. Colour a dingy semi-transparent pale green, barred with dark brown, or nearly black; head pale wainscot-brown and polished; and there are rather long hairs scattered over the body.

They fed up well and rapidly on both the white and red species of clover, and when from an inch to an inch and a quarter in length, I described them as follows:—

Long and slender for the size of the moth; body evenly rounded above, flattened below, tapering a little at the extremities; the head has the lobes rounded, and is a little wider than the second segment; skin smooth but not polished; segmental divisions well defined; the anal prolegs extended beyond the fold, and forming a distinct angle. By this time they have lost the true looper style of walking, but are still half-loopers, having no prolegs on segments 7, 8, 11 and 12. The ground colour varies from pale salmon to dull pink, some specimens having a strong yellowish tinge; a distinct double yellow line, enclosing another very fine still paler line, forms the dorsal stripe; the anterior point of the pale line on the crown of the head forms the apex of a triangular mark, the base of which is over the mandibles; the rest of the head is very dark brown; the sub-dorsal lines are dull bluish, bordered with smoke-colour, and enclose fine pale greyish lines; below the spiracular stripe is another irregular greyish line; and below this, but above the spiracles, is another line of pale bluish, edged with smoke-colour; the spiracular stripes are yellow, rust colour, or pink, in different specimens. The colours, indeed, vary considerably in different examples, in some the blue side-stripes being scarcely discernible; spiracles black, as are also the tubercular dots, which, though small, can be distinctly seen with a lens. Ventral surface dull dark smoky-purple, with two yellow central lines.

Most of the larvæ were full grown by August 7th. Length, an inch and three-quarters, and the salmon and pink colours of the younger specimens altogether lost.

The ground is now of various shades of ochreous-yellow, the darker specimens having a strong rust tinge along the sides; head of various shades of brown, in some being of a dark sienna colour; in all there is the pale yellow front triangular mark so noticeable in the earlier stage, and there is also another distinct streak of yellow on the side of each lobe; a brown stripe enclosing a very fine yellow line, and broadly edged outwardly with yellow, forms the dorsal stripe; a double smoke-coloured line composes the sub-dorsal stripe, and between it and the dorsal stripe are two other irregular yellow lines; above the spiracles is a yellow line edged on each side with smoke-colour, and between it and the sub-dorsal stripe another irregular yellow line; spiracles and tubercular dots black.

Ventral surface of various shades of dull ochreous, with two greyish central lines; a black mark on the 7th and 8th segments; and a smoke-coloured stripe below the spiracles.

Feeds during the night; in the day-time remains extended at full length, flat along the stalks of the food-plant.

The cocoon is composed of bits of the food-plant, firmly knitted together with very closely woven silk; in a state of nature, however, it would probably be on the ground. The pupa is about five-eighths of an inch long, and of the ordinary shape, though rather blunt and dumpy; colour deep purplish-brown, with the abdominal divisions and spiracles still darker; it is powdered over with a very pretty violet bloom, though more so on the head, thorax, and wing-cases, than elsewhere.

From these larvæ I reared a long and beautiful series of imagos the following June.—GEO. T. PORRITT, Highroyd House, Huddersfield: *January 8th*, 1881.

How to find the larva of Triphaena subsequa.—January and early February, if mild in the season, to sweep for the larvæ of *T. subsequa*. It feeds at night but is out on the blades and stems of grass in the afternoons, stretched at full length; it frequents dry sandy banks, especially where dense beds of *Dactylis glomerata* appear, I think it is entirely a grass feeder in its natural state, though it will eat other herbage in confinement, at least, I have never found it feeding on anything else but *D. glomerata* and *Triticum repens*.—H. WILLIAMS, Croxton Vicarage, Thetford: *December 28th*, 1880.

[These notes are additional to those published by Mr. Williams in this Magazine, vol. xiii, p. 210.—EDS.]

Remarks on monogamy, or the contrary, in Insects.—The remarks of Messrs. Douglas and Butler, *ante* pp. 114, 133, have brought to my mind two circumstances that may be of some little interest.

When at Norwich some years ago, I had the curiosity one day to examine the little bunches of dead hawthorn leaves, so common in closely clipped quickset hedges in the winter. To my surprise I found almost every bunch held together and fastened down to the twigs by a cocoon of the Vapourer (*O. antiqua*), and in nearly every case the cocoon was that of a female—evidenced by the hatch of eggs spread regularly over it. It then occurred to me as a possible explanation, that the female larva must seek by preference a more sheltered or protected situation than that of the male. This may sometimes cause an apparent inequality in numbers between the sexes in the larva-state, certainly it would help to account for the difficulty of finding the female moth.

My other observation refers to the delicate subject of monogamy v. polygamy among insects. Mr. Butler's instance is hardly to the point, as his female proved sterile, and previous observations—as in the case of *Peridea trepida*, have shown that sterility may be the cause (or consequence) of repeated, and of course imperfect, union. But some years ago I had a lot of moths from silkworms (*Bombyx mori*) that the children had been rearing, and it occurred to me to subject them to a series of experiments. The result was that I found that each perfect male mated four, five, or even six times in the course of its short life, and the females each four or five times, and in all cases, even those of old males mated with recently emerged females, the eggs proved fertile. The rule appeared to be that union took place before the deposition of *each separate batch* of eggs.

I am fully prepared to admit that the habits of a moth reduced to so abnormal a state as to have lost the power of flight by domestication, cannot be held to be illustrative of those of species in a natural state, but I also think that such a creature possesses only an *exaggeration* of the habit and capabilities of the species when at large, and that there is little danger of female insects in a state of nature remaining sterile through the casual circumstance of a diminished proportion of males.—CHARLES G. BARRETT, Pembroke: December 9th, 1880.

Notes on Hymenoptera near Worcester in 1880—Notwithstanding that the spring came in early and fine, the solitary *Aculeata* were very few in both species and individuals, and continued so throughout the year. Even *Bombi* and *Apathi* were much scarcer than in 1879; but *Vespa vulgaris*, *V. germanica*, and *V. sylvestris* were about as common as usual.

The galls of some species of *Cynipides* were commoner than in any year since 1876; *e. g.*, *Dryophanta folii*, *D. divisa*, and *D. longiventris*: the last more numerous than I ever before witnessed. Galls of *Biorhiza renum*, which I vainly sought for since 1876, were again found.

The year seemed to be very favourable to some of the *Tenthredinidæ*. Among the species that turned up in the imago state in unusual numbers I may mention *Tenthredo mesomela*, *Tenthredopsis nassata*, and *Taxonus glabratus*. Among larvæ, *Hemichroa alni* and *Cræsus septentrionalis* were strikingly plentiful on all their food-plants. *Nematus ribesii*, larva and imago, was most abundant. When walking among some market gardens at the end of July, I noticed hundreds of gooseberry bushes standing bare of leaves, and presenting a most desolate sight.—J. E. FLETCHER, Happy Land, Worcester: November, 1880.

Notes from Guatemala.—Since my last notes from San Gerónimo, I have twice visited the Polochic Valley, working down to the lake of Isabal; travelled over a great deal of the Alta, or northern part of Vera Paz, visiting Cahabón, Lanquin, Rio Chicoy, the Poban District, the Sinanjá Valley, Senahú, and nearly to the department of Peten. At the end of July I started for Los Altos and the Pacific slopes, travelling from San Gerónimo, by way of Rabinal, Cubulco, Joyabáj, and Quiché. I spent about a fortnight in the mountains of Sotonicaján, working up to nearly 11,000 ft.: then went to Quezaltenango, and from thence to the Pacific slopes of the volcano Zunil and Santa Maria, gradually working lower, till at last I arrived within

five leagues of the sea; being so near to the coast, I thought I would pay a hurried visit to Champerico, in spite of the terrific heat. I should like to send particulars of the fauna of the places visited, but have not sufficient spare time now.

I have met with varying success. In the pine forests of the very high elevations I found many genera, as at home:—*Epuræa*, *Temnochila*, *Astinomus*, *Hylastes*, *Hylurgus*, *Tomicus*, *Clerus*, *Rhizophagus*, *Phlæopora*, *Xantholinus*, *Helops*, *Bembidium*, *Amara*, *Hydnobius*? (a black species in moss, at 10,800 ft.), *Otiorkynchus*, *Geotrupes*, *Aphodius*; small *Brachelytra* and many others, including some *Heteromera* allied to *Zopherus* and *Sepidium*; a small black and yellow day-flying Bombycid moth occurs in vast profusion at the highest places visited on the Cordillera. Here, on the coast, in two days' work, I have found, in addition to some interesting *Hymenoptera*, some few *Cicindelidæ*, small *Carabidæ*, *Heteromera*, &c.; the *Carabidæ* include such genera as *Harpalus*, *Amara*, *Metabletus*, *Blechnus*, *Lebia*, *Tachys*, *Bembidium* and the like; the *Heteromera*, divers *Anthicidæ* (*Anthicus* and *Mecynotarsus*), *Crypticus*, *Heliopathes*, *Phaleria* (two or three species, one nearly allied to, if not identical with, our own *cadaverina*), *Cistela*, &c. There are a few small *Brachelytra*, a small *Elater* (*Drasterius*), an *Ischnomera* (very similar to our own *melanura*, but smaller), a *Saprinus*, *Galeruca*, *Psammodius*, and some few others—all very similar to the species of our own coasts, but averaging smaller in size. I look in vain for representatives of *Broscus* or *Philonthus xantholoma*. In the *Hemiptera* I find a few small *Pentatomidæ*, a *Geocoris*, *Ophthalmicus*, a small *Capsus* or two, a *Coranus*, *Naucoris*, &c. In *Lepidoptera*, a very minute *Lycæna*, common amongst *Salicornia*?, a *Heliothis*, and a few others. In *Neuroptera*, only a few *Libellulidæ*, of species common in the interior.—GEO. C. CHAMPION, Puerto de Champerico, Guatemala: October 31st, 1880.

Obituary.

Jacob Boll was born at Würenlos in Switzerland, in 1828. After he had prosecuted his studies at Jena in Germany, he settled at Bremgarten in Switzerland as an apothecary. He was enthusiastically fond of natural science, especially Entomology and Botany, and devoted to these pursuits all his spare time.

He and Heinrich Frey first met in 1849 or 1850, at the house of Bremi-Wolff in Zürich, and they soon became firm friends. "Boll" says Frey, "was a born-collector, with a wonderful quick eye."

For many years Professor Frey met Boll repeatedly and they made excursions together. Boll's parents and an elder brother had emigrated to the United States and were settled in Texas, Jacob Boll had often talked of following them thither, and in 1869 he sold his business at Bremgarten and went to Texas.

After collecting there for 18 months, he was returning to Switzerland, when he met with Professor Agassiz at Cambridge, Massachusetts, who purchased from him his entire collection and promised to obtain for him employment at the Natural History Museum of Harvard College.

However, Boll returned first to Switzerland, and there family circumstances detained him for some time, Agassiz in the mean while still expected Boll's return to Cambridge, and the situation was kept open for him.

At last the cause of Boll's detention in Switzerland was at an end, and he was preparing to return to Agassiz, when a telegram announced the death of the latter, and that opening of a career for Boll was unfortunately closed.

Boll then returned to Texas and settled at Dallas, where for many years he collected insects most industriously, and, as we can speak from experience, he enriched the collections of Micro-Lepidopterists with long series of beautifully set bred specimens of North American Micros.

Latterly his attention had been more turned to geological and archæological researches, but we have lately heard that he had hoped to obtain the recognised position of State-Entomologist of Texas.

Early in September last, he started on an exploring expedition to the western part of Texas, there he was taken ill, and far from all medical assistance he died on the 29th September.

Achille Guenée—born at Chartres, January 1st, 1809, died at Châteaudun, December 30th, 1880—was, like his colleague Dr. Boisduval (who died precisely twelve months previously), one of the most distinguished Lepidopterists of France.

He received his education at the "collège" of Chartres, being one of the most promising pupils there. In early childhood he showed a taste for Entomology, and, when quite a boy, he knew no greater pleasure than the pursuit of the butterflies which frequented the neighbourhood of Chartres.

As years passed on, he soon applied himself more seriously to the study of his favourite Order of insects—the Lepidoptera, incited thereto by the good advice of his older friend, Mons. François de Villiers; in conjunction with whom, at a later date (1835), he brought out a thin quarto volume ("*Tableaux synoptiques des Lépidoptères d'Europe*").

At the close of his college career, he went to Paris to study law; the dry attractions of which had no effect in cooling his passion for Entomology, which derived fresh fuel from the sight of the collections at Paris, and the society of the numerous Entomologists who resided in the capital.

On his marriage in 1833, he quitted Paris and settled himself at Châteaudun, where he resided till 1846. He then returned to Paris to superintend the education of his son. It was at this period that, being in constant intercourse with Dr. Boisduval, he began to write the first volume of his *Noctuélites*, which was not published till 1852. It was during this interval that he received "un coup cent fois plus cruel" noticed in the preface to the *Noctuélites*, p. xxiii—the loss of his only son, who already gave great promise of future excellence.

This led to his quitting Paris abruptly—he returned to Chartres; there he could recall and apply his own words, addressed to the Société Entomologique de France, February 14th, 1849, when speaking of the benefits to be derived from Entomology—"Pensons," said he, "*aux blessures de cœur qu'elle a guéries, aux illusions prêtes à s'envoler qu'elle a retenues, aux mécomptes dont elle a consolé, aux chagrins légitimes dont elle a adouci l'amertume, aux joies tranquilles dont elle sème la vie. Soyons fiers du bonheur qu'elle donne au pauvre comme au riche, à l'homme que le travail a fatigué, comme à celui que l'oisiveté tourmentait,*" &c.

Again, however, he was destined to experience the pleasures appertaining to a father; two daughters were successively born, and, accompanied by his wife and

daughters, he went to reside at Châteaudun, and at his country seat, "Les Chatelliers," in the neighbourhood. It was there, that in 1857, we had the pleasure of seeing him. It was but seldom that he quitted the country for Paris; but, by a strange coincidence, on the occasion of our very last visit to Paris, in March, 1872, we met Guenée there—we were never to meet again.

Guenée leaves a widow, two daughters (who are married), and three little grandsons. Let us hope that one of those grandsons may develop the tastes of his grandfather, and become a shining Entomological light in the next century.

The career of Guenée as an Entomological writer commenced in 1833, with a notice of the habits of the larva of *Nonagria paludicola* (*var. geminipuncta*) in the "Annales" of the French Entomological Society, vol. ii, pp. 447—453.

This was followed by several similar short notices, and, from 1837 to 1841, he wrote a series of papers on *Noctua*, including an Essay on the Classification of the *Noctua*; these appeared in the "Annales" of 1837, 1838, 1839, and 1841. These papers may be looked upon as the preparatory steps to his larger work on the *Noctua*, which appeared some years later. It was probably during this period that he furnished some of the descriptions of larvæ which appeared in Duponchel's "Iconographie des Chenilles."

In the French "Annales" for 1845, he published an Essay on the Classification of *Micro-Lepidoptera*, with a Catalogue of the European species. This paper (though without the interesting introductory chapter which occurs in the "Annales") was also published in a separate form under the title of "Europæorum Micro-Lepidopterorum Index Methodicus." This "Index" goes systematically through the *Tortricina* and *Crambina* (many new species being briefly described in Latin); but of the *Tineina* only the *Plutellidæ* and a portion of the *Hyponomeutidæ* were given.

No doubt the author had intended (as he calls this "*Pars Prima, sistens Tortrices, Phycidas, Crambidas, Tinearumque initium*") to have brought out subsequently a "*Pars Secunda*," with the remainder of the *Tineina*; but his subsequent Herculean labours amongst the *Macro-Lepidoptera* prevented the completion of this "Catalogue of *Micro-Lepidoptera*."

Guenée's greatest work appeared in 1852—3 volumes 8vo, extending to more than 1300 closely printed pages, treating of the *Noctua* of the whole world. At the time this appeared the mass of interesting matter relating to the habits of species, as observed by the author himself, formed a vast addition to our previous knowledge of the subject.

These volumes formed part of the Series of the Suites à Buffon "Spécies Général des Lépidoptères," of which the first volume, treating of a portion of the *Rhopalocera* from the pen of Dr. Boisduval, had appeared as far back as 1836 (see Ent. Mo. Mag., xvi, p. 235). In 1854 Guenée brought out another volume of the Series containing the "*Deltoides et Pyralites*." Three years later there appeared two more volumes containing the *Geometrina* ("*Phalénites*").

There are thus six volumes of the Suites à Buffon from Guenée's pen, and no Entomological Library is complete without them.

In 1868 there appeared, in the 5th volume of this Magazine, a series of descriptions by Guenée of *Heterocerous Lepidoptera* collected by Mr. Fereday in New Zealand.

In the French "Annales" for 1870, p. 5, Guenée described the singular gall-making Lepidopterous insect, *Œcoecis Guyonella*. This is immediately followed (p. 17) by a very interesting account of an Entomological excursion to Celles-les-Bains, in Ardèche; a locality to which attention had already been drawn by the visits thither of M. Millière and of Dr. Staudinger.

In 1875 there appeared a Catalogue Raisonné of the *Lepidoptera* of Eure-et-Loir, the Department in which Châteaudun is situated. This was a publication of the Société Archéologique d'Eure-et-Loir, and was probably printed at intervals—the title page bears date 1867; the introduction is dated "Mars, 1866," and the concluding paragraph bears date "1^{er} Mai, 1874." This is, we believe, the last work which emanated from Guenée's pen. It possesses for us a more than common interest, for in it we find that two previous notions, which had to us appeared strangely unscientific, are quietly ignored.

In the first volume of the *Noctuérites* of the *Suites à Buffon*, p. 320, we read, *Triphæna pronuba*, Albin; in the *Lépidoptères d'Eure-et-Loir*, p. 192, we find the more generally used expression, *Triphæna pronuba*, Lin. Further on, in the same volume, we find the uniform *-ella* termination for *Crambina*, &c., gently dropped. Thus we find, p. 273, *Scirpophaga alba*, p. 275, *Galleria cereana* and *Melliphora alvearia*; thirty years previously, in the *Index Micro-Lepidopterorum*, these three species had all been forced to bear the termination *-ella*.

In the very last paper published by Achille Guenée, "Etude sur les Yponomeutides," in the "Annales" of the French Entomological Society, 1879, p. 281, we have an instance of the mellowness of feeling produced by advancing years in the very benign mention of the Museum Catalogue of Francis Walker; he only remarks that "cet ouvrage n'a pas assez de précision," to allow of the species described being quoted without a personal* investigation.

ENTOMOLOGICAL SOCIETY OF LONDON.—December 1st, 1880. Sir J. LUBBOCK, Bart., M.P., &c., President, in the Chair.

Mr. Pascoe exhibited a series of *Arescus histrio*, collected in Ecuador by Mr. Buckley, illustrating the extreme and asymmetrical varietal conditions; the Rev. H. S. Gorham and Mr. C. O. Waterhouse also alluded to the same subject.

Mr. Billups exhibited four species of *Pezomachus* (noticed as *Mülleri*, *juvenilis*, *intermedius*, and *incestus*) new to Britain; also 20 species of *Coleoptera* from corn-refuse from Mr. Fitch's granaries at Maldon.

Sir J. Lubbock exhibited specimens of one of the *Phasmidæ* sent to him from St. Vincent.

Mr. Cansdale exhibited examples of *Tischeria gaunacella*, bred by him from *Prunus spinosa*.

Mr. Scott communicated a paper on *Hemiptera* from Japan.

Mr. C. O. Waterhouse read a paper on a new species of *Polycetes*, in which he retracted his former opinion as to the affinities of the genus, and acknowledged its connection with the *Hemiptera*.

* We are by no means certain that this necessity of personally examining "Walkerian" types has not been a great service to our favourite science. Learned students of various groups of insects come from the very ends of the earth to consult the collection of the British Museum, and but for this imperative necessity of their so doing, who knows whether some would ever have visited Europe at all? Thus, indirectly, Francis Walker may have conferred a great boon on our science.

TRICHOPTERA AND NEUROPTERA OF THE UPPER ENGADINE
IN AUGUST.

BY R. McLACHLAN, F.R.S., &c.

In the "Entomologist's Annual" for 1871, pp. 15—17, I published a few notes on Swiss *Trichoptera*, some of which related to materials collected by Mr. Stainton in the Engadine in 1870. At that time the hope that I might some day go over the same ground scarcely existed with me. However, on August 6th, 1880, I left home at 8 a.m. for the Engadine, and travelling direct *viâ* Boulogne, Paris, Belfort, and Basle, arrived at Zürich at 12.30 p.m. on the 7th. Leaving Zürich on the morning of the 9th, I was at Chur in the afternoon of the same day. Having *posted* my portmanteau for Pontresina, I walked on to Churwalden in the evening, and slept there, joining the diligence party at 8.30 next morning,* for the Engadine *viâ* the Albula Pass. The burning of the old bridge over the Rhine at Reichenau, which occurred a day or two previously, probably diverted, for the moment, some of the traffic over the Julier Pass *viâ* Thusis, so that from Churwalden to Samaden (within three miles of Pontresina) the travellers formed quite a large party, accommodated in two large diligences and three "supplémentaires." The weather was tolerably fine, but cold: snow had fallen the previous night on the Albula Pass, and the mountains had a thin covering of fresh snow; large patches of unmelted old snow also lay here and there in hollows far below the road, for the summer had not been a warm one in Switzerland. At the Albula Hospice (7582 feet) the rush of shivering travellers in quest of hot coffee was almost ludicrous. Delay was occasioned in waiting for lateral posts, &c., and it was past 9 p.m. before we reached Pontresina, where the portmanteau had previously arrived by a night post. To my dismay all the hotels were crammed, and any chance of obtaining a bed in one of them was hopeless; not a pleasant prospect at that time of night, and especially as I had planned a stay of ten days. However, a room in a small house, difficult of access, and still more difficult to descend from in the morning, was procured, and here I stayed until the 20th, taking meals only in one of the hotels.†

* By this means the inconvenience of having to leave Chur at 5.30 a.m. was avoided.

† The simplicity of the Engadine is a thing of the past. "Society" has taken possession of the district, at any rate in August, and I more than once heard Pontresina, St. Moritz, and St. Moritz Bad likened to Brighton carried into the Alps. At Pontresina 800 beds are now not sufficient to accommodate the visitors in August. As a hint to future travellers who (like myself on this occasion) may be alone, it is well to say that fair sleeping accommodation may sometimes be obtained in houses belonging to a resident who lets out the rooms, and, if it be preferred, meals can be obtained in a German restaurant, thus avoiding the hotels altogether. In July the place is not so full. The Americans, so ubiquitous in the Bernese Oberland, have not yet appeared in the Engadine in force.

Pontresina itself lies at an elevation of 5915 feet, and the district explored by me occupies about ten miles in various directions therefrom, and at from 5600 ft. to 6800 ft. in elevation. The return journey was *viâ* the Julier and Schyn Passes (arrangements having been made, in the meantime, for the conveyance of passengers and their belongings on an improvised raft across the river at Reichenau), and the highest point at which any Trichopterous captures were made was at the little inn on the summit of the Julier Pass (7503 feet) during the short time the diligence stopped.

The principal hunting-grounds were the Val Roseg as far as the glacier; the Lake St. Moritz, and the Statzer-See (in the wood) which discharges into it; the Val da Fain (no doubt a paradise for a Lepidopterist, but practically useless for my purposes, owing to the utter absence of trees and the snow-fed stream); the wild rocky ground in a forest of larch and arolla (*Pinus cembra*) through which the torrent from the Piz Languard finds its way; a nearly similar locality on the right of the road to Samaden; the Val Celerina (in which are magnificent old larches); and the Val Bevers.

In my "Revision and Synopsis of the *Trichoptera* of the European Fauna," Appendix, p. xciv, I pointed out the deterrent effects of the vicinity of glaciers on aquatic insect-life. Those remarks came before me very vividly on this excursion. The stream at Pontresina, termed the Flatzbach, is utterly devoid of Trichopterous life, being poisoned by the Roseg and Morteratsch glaciers, but above the latter it is productive. A glacier-fed stream is turbid and milky; a snow-fed stream is usually clear and blue after the spring and early summer meltings are over, but even such a stream as this is seldom very productive, unless it is also largely fed by lateral rivulets from land springs, and these latter are the best of all. Naturally, in such a district these are not abundant, and long distances must be travelled over for their discovery *

The results of my excursion were about 450 specimens, represented by the species enumerated below. Rather to my disappointment, no species that can absolutely be identified as new was discovered; but some purely alpine forms were abundant; still, however, not so great a number of species were taken as I had anticipated finding. There was a marked absence of those small forms usually so abundant in lower districts where the water is warmer. The

* Geological conditions also influence aquatic insect-life. Limestone districts are probably the best. Schist is fatal; perhaps the most remarkable instance of this is to be seen at Thusis, where, in consequence of schist, the Nolla, at its junction with the Rhine, is of inky blackness, and useless for entomological purposes.

Trichoptera are chiefly represented by alpine *Limnophilidæ* and *Rhyacophilæ*. Perhaps the most remarkable of all is *Limnophilus subjectus*, about the last species I expected to find: originally recorded from Arctic America (and extending to Maine in the United States), it has lately been found commonly in Finland and Scandinavia, but its most southerly known distribution in Europe was the south shore of the Baltic; essentially a boreal species and an inhabitant of districts of little elevation in the north, we find it again in the high Alps at about 6000 feet, a striking instance of the affinity that exists between the insects of the north and those of the high Alps very much further south, and under differing physical conditions, excepting the one point of probably equal mean temperature.

For greater abundance, both in forms and individuals, a lower elevation, warmer water, and richer shelter, are necessary. Very few of the species found by Professor Zeller at Bergün (about 4550 ft., on the other side of the Albula Pass) were seen, and many of my captures were not represented amongst his. Difference of season may partially account for this, but the main reason is difference of altitude. On my journey from Churwalden I took mental notes on the probable capability of the localities, and the most likely of these appeared to be between the village of Filisur and Bergün, a mile or two from the former.

The Upper Engadine captures were as follows:—

TRICHOPTERA.*

PHRYGANEIDÆ.

Phryganea obsoleta (Hag.), McLach.—Not uncommon at the Statzer-See; it had been only recorded as Swiss from a specimen caught by Mr. Stainton at Maria in 1870, but at Zürich I found that it occurs near that city, and probably in other localities, the Swiss Entomologists having confounded it with *Ph. varia*.

LIMNOPHILIDÆ.

Limnophilus rhombicus, L.—One ♀ at the streamlet between the Statzer-See and Lake St. Moritz. Certainly an unusual altitude for this insect: the example is very typical in size and colours, but the appendages (known to vary) are much more linear (less dilated at the base) than is usual.—*L. despectus*, Walk.—Two ♀; Statzer-See and Val Bevers, beaten from *Pinus cembra* (*vide supra*).

Acrophylax zerberus, Brauer.—One ♀ at a torrent between Pontresina and Samaden; as yet this is a scarce insect.

Asynarchus canosus, Curt.—The large alpine form was generally distributed and common; especially so between Pontresina and Samaden, where it was sitting on the "stone posts" mentioned in my notes in Ent. Ann., 1871, p. 15. I suspect the larvæ do not affect torrents, but live in shallow, almost standing water, such as is often found by the roadsides.

* The nomenclature used here is the same as in the Systematic Catalogue in my "Revision and Synopsis."

Stenophylax picicornis, Pict.—The ♂ common at a lateral streamlet in the Val Roseg, but only one ♀; one ♀ near the Statzer-See.—*S. latipennis*, Curt.—Val Celerina, two very dark ♀.

Halesus digitatus, Schrk.—One ♂ between Pontresina and Samaden (probably early), darker than examples from flat districts.—*H. ruficollis*, Pict.—More than twenty examples; especially frequent at a torrent between Pontresina and Samaden (I now suspect that *H. maestus*, McLach., is not distinct).—*H. hilaris*, McLach.—One ♀ at the torrent above-mentioned (probably early).—*H. auricollis*, Pict.—Scarce (probably early). Two ♂ between Pontresina and Samaden, one ♀ on the summit of the Julier Pass.

Metanæa flavipennis, Pict.—Generally distributed; very common in the Val Celerina; varying greatly in size.

Drusus discolor, Rbr.—Generally distributed and common; about fifty examples, varying much in size and in the comparative duskiess or brightness of the wings.—*D. chrysotus*, Rbr.—Rare. One ♂ and one ♀ in the Val Roseg near the glacier, one ♀ in the Val da Fain.—*D. trifidus*, McLach.—Streamlets supplying the Statzer-See; more common at small streamlets between Pontresina and Samaden. The examples are remarkably small.

Cryptothrix nebulicola (Hag.), McLach.—Abundant at the torrent in the Val Languard, and also at another between Pontresina and Samaden; those from the latter locality are very large.

Potamorites biguttatus, Pict.—Three very dark ♂ at a streamlet in the wood opposite Pontresina, but no ♀: thirteen ♀ along the stream in Val Bevers, but no ♂ (almost the only species found along this snow-fed stream). I am at a loss for a reason to account for this unequal distribution of the sexes. The ♀ shows great variability in the length of the discoidal cell, as already remarked.

LEPTOCERIDÆ.

Beraea pullata, Curt.—Two ♂ at boggy ground in Val Bevers.

Odontocerum albicorne, Scop.—Very common at the Lake St. Moritz; also along the Inn between Celerina and Samaden.

Mystacoides nigra, L.—Lake St. Moritz.

HYDROPSYCHIDÆ.

Dolophilus copiosus, McLach.—One ♂ in the Val Celerina.

Wormaldia occipitalis, Pict.—One ♂ between Pontresina and St. Moritz.

Plectrocnemia conspersa, Curt.—One ♂ at the stream between the Statzer-See and Lake St. Moritz.

Holocentropus dubius, Rbr.—One ♂ at the Statzer-See.

RHYACOPHILIDÆ.

Rhyacophila persimilis, McLach.—A few examples at the falls of the Inn at St. Moritz. A few others from the stream between the Statzer-See and Lake St. Moritz show a distinct difference, although the localities are so near each other. They have the dorsal process shorter and broader, and the dilatations of the penis more acute, thus showing a tendency towards *Rh. acutidens*, McLach., without, however, being sufficiently pronounced to be identified therewith.—*Rh. vulgaris*, Pict.—Decidedly scarce; taken singly above the Morteratsch glacier, and between

Pontresina and Samaden.—*Rh. proxima*, McLach.—Nearly fifty examples of what I am bound to consider *proxima* were taken at various torrents in the district (also one ♀ on the summit of the Julier Pass). In examining this long series, a good deal of variation is evident (independent of locality) in the form of the dorsal lobe and in that of the penis, which latter not infrequently has the angles distinctly (though but slightly) produced, and in this case difficult to separate from *intermedia* (*contracta* and *fraudulenta* I take to be sufficiently marked, according to present evidence). The examples are mostly very large (one ♀ expanding to 37 mm.). The variation in the horny anal parts is of somewhat serious interest; in one ♂ the dorsal lobe forms an elongate triangle, and had it not occurred with more ordinary conditions, this example must have been considered specifically distinct.—*Rh. glareosa*, McLach.—At the torrent in the Val Languard, and at another between Pontresina and Samaden, also at a waterfall in the Val Bevers; tolerably common.—*Rh. stigmatica*, Kol.—In company with the last at the torrents mentioned, and more common than it.

PLANIPENNIA.

SIALIDÆ.

Sialis lutaria, L.—Lake St. Moritz; of ordinary size and colour; very late for this species.

CHRYSOPIDÆ.

Chrysopa vulgaris, Schnd.—One example between Pontresina and St. Moritz; the only species seen.

HEMEROBIIDÆ.

Hemerobius nervosus, F. ?—A few ♀ from Val Roseg, Val Bevers, and between Pontresina and Samaden; beaten from larches (I am by no means certain that these are true *nervosus*, the ♀ having a short upturned ovipositor).—*H. fasciatus*, Göszy.—A few examples with the last.

CONIOPTERYGIDÆ.

Coniopteryx psociformis, Curt.—One example near the Morteratsch Glacier.

PSEUDO-NEUROPTERA.

PSOCIDÆ.

Elipsocus unipunctatus, Müll.—One example in the Val Roseg.

PERLIDÆ.*

Dictyopteryx alpina, Pict.—On the Flatzbach and between Pontresina and Samaden; taken singly. This is one of the few insects that can exist in glacier-fed streams. Along the Flatzbach the nymph-skins were numerous, sticking on stones, &c. In the Val Roseg I found three ♀ (under stones) of what must be a micropterous form, in which the wings are not longer than the abdomen when in a fresh state; they agree with the long-winged form in all other respects. It is probable that this form was considered by Pictet as the ♂ (cf. "Perlides," p. 162, pl. viii, fig. 7); the examples before me appears to be certainly ♀. In a series of nearly 20 examples of *D. alpina* I find only two or three that seem to be ♂, and in those the wings are not abbreviated.

* The nomenclature in Lists of *Perlidae* must be considered as approximate only; there are few Families of insects that so greatly need thorough revision, and in which the difficulties are so many.

Chloroperla rivulorum, Pict.—Generally distributed along the torrents. All the specimens collected appear to pertain to this species.

Isopteryx torrentium, Pict.—Generally, but sparsely, distributed. The examples appear to belong here rather than to *tripunctata*, Scop. (*flava*, Pict.).

Leuctra cylindrica, Pict.—Here and there; a few examples. (It is scarcely probable that this is the *cylindrica* of De Geer).—*L. nigra*, Pict.—One example from near the Statzer-See should probably be referred here.

Teniopteryx pratextata, Burm.?—Val Roseg.—In the same locality was found another species of the genus, which I cannot identify.

Nemoura inconspicua, Pict.—Val Roseg.

EPHEMERIDÆ.

The few materials for this Family are in Mr. Eaton's hands, and have not yet been fully determined. A large *Heptagenia* allied to *longicauda*, Steph., was very common at the Lake St. Moritz; another species of the same genus, allied to *semicolorata*, Curt., occurred sparingly in other localities. A *Baëtis* was found at the Statzer-See.

ODONATA.

Sympetrum striolatum, Chp., and *S. scoticum*, Donovan.—Statzer-See.—*S. meridionale*, Selys.—Sparingly, usually along the road-sides far from water; infested with the red *Acari* to the attacks of which this species seems so particularly liable.

Cordulia metallica, V. d. L., *C. alpestris*, Selys, and *C. arctica*, Zett.—Statzer-See (*vide ante*, p. 141).

Eschna juncea, L., and *E. borealis*, Zett.—Statzer-See (*vide ante* p. 141).

Three or four other species of Odonata were seen at the Statzer-See, but could not be caught on account of the boggy nature of the ground; amongst them was one of the *Agrionidæ* (probably *Enallagma cyathigerum*, Chp.).

Lewisham, London: December, 1880.

NOTES ON EXOTIC RHYNCHOTA.

BY W. L. DISTANT.

HETEROPTERA.

Fam. REDUVIIDÆ.

APIOMERUS OBERTHURI, n. sp.

Black; apical half of membrane creamy-white, under-side of body dull luteous, disc of abdomen pitchy, coxæ, trochanters, and femora sanguineous, eyes luteous.

Length, 20 mm.

Hab.: Teffé (Ega), Amazons (*de Mathan*). Coll.: Oberthür.

Allied to *A. apicalis*, Burm.; but differs in the colour of the legs and the narrower pronotum, with the central longitudinal incision to posterior lobe narrower, but more sharply defined.

HOMOPTERA.

Fam. MEMBRACIDÆ.

TRIQUETRA INTERMEDIA, *n. sp.*?*Triquetra inermis*, Fairm., *var.*?

Closely allied to *T. inermis*, but differs by the anterior dorsal ridge of the pronotum being produced into a distinct, compressed, erect, and somewhat anteriorly-directed spine-like process. Length, 14 mm.

Hab.: Bogota (*Dr. Thième*). Coll.: Oberthür and Distant.

This form is intermediate between *T. inermis*, Fairm., and *T. nigro-carinata*, Fairm., and only differs by the following characters:—from the first, in which the dorsal spine is absent or obtusely indicated; and, from the second, in which the same spine is much more produced.

As in *T. inermis*, many specimens exhibit a strong tendency to develop prominently this pronotal spine, I should incline to the opinion that *T. intermedia* is only an intermediate form between the two other described species (?), and that the three are only phases of one protean type. However, I have been reluctantly obliged to give the specimens described a specific name to prevent my treating *T. inermis* and *T. nigro-carinata* as synonymic, more especially as Stål has described another species, *T. recurva*, in which this spine is even more produced, but of which that author remarks: "*T. inermis* et *T. nigro-carinata* valde affinis, cornu dorsali ejusque forma divergens;" and also, "In exemplo feminino, specifice haud diverso, cornu lateralia thoracis valde antrorsum et sursum vergunt." This last observation may be probably explained by the law frequently enunciated and lately again exemplified in butterflies by Mr. Wood-Mason (J. A. S. B., vol. xlix, p. 418), that secondary sexual characters acquired by the male have been partially transmitted to some females, but not to others. As *T. inermis*, *T. intermedia*, *T. nigro-carinata*, and *T. recurva*, have all been received from Colombia, and as they are also distinct from other species of the genus in the common character, "Carina dorsali thoracis nigra," and their specific differentiation depends on the amount of development of the anterior portion of the pronotal dorsal ridge, the probability of them all being but different forms of one protean species is much increased, and we may possibly only require larger series of specimens to find all the intermediate links. The words of Mr. Darwin may be here well applied: "A part developed in any species in an extraordinary degree or manner in comparison with the same part in allied species, tends to be highly variable."

Selston Villas, Derwent Grove, East Dulwich:
January, 1881.

AN ADDITIONAL SPECIES OF BRITISH HOMOPTERA.

BY JAMES EDWARDS.

Several examples of both sexes of the insect described below were sent to me for examination some time since by Mr. Douglas, with an expression of his opinion that it would prove to be the *Anomia sulphurella*, Zett., of Lethierry's catalogue. Having mounted the ♂ genitalia, and found that it differed in that respect from the species to which it is apparently most nearly allied, viz., *rosæ* and *Douglasi*, I sent a pair to Mr. Lethierry, who returned them as the *sulphurella*, Zett., of his catalogue. According to Sahlberg, however, *sulphurella*, Zett., = *Thamnotettix virescens*, Fall., and, therefore, another name becomes necessary for our insect, and the one I have applied seems expedient. The structure of the central genital process (genital style) in the ♂ will, I think, sufficiently demonstrate the distinctness of the insect before us. In the case of single examples of the ♀ some care is requisite, in order to separate this species from *rosæ*, ♀; the latter is, however, somewhat smaller, and the crown is longer and narrower, with the outline of the posterior margin in a continuous curve, without any trace of an angle.

TYPHLOCYBA LETHIERRYI.

Anomia sulphurella, Lethierry, Cat. Hem. Nord., edition ii, p. 75.



Crown: posterior margin (including the eyes) forming a distinct but obtuse angle, anterior margin gently convex in the ♂, more produced, with straighter sides, in the ♀.

♂. Deep yellow, inclining to orange. Elytra with the costa generally, and the inner margin sometimes, narrowly reddish, membrane and some wedge-shaped spots on the corium hyaline. Posterior tibiæ generally tinged with pink; anterior and intermediate tarsi sometimes, and all the claws always, fuscous. Genital style with three branches at the apex, of which one, the lower, is three-pointed, and the other two are bifid (fig. a).

♀. Pale whitish-yellow. Membrane very faintly tinged with fuscous. Tarsi and claws as in the ♂. Length, $1\frac{1}{2}$ lines.

Figures *b* and *c* show the structure of the genital style in the ♂ of *T. rosæ* and *T. Douglasi* respectively.

Mr. Douglas' specimens were from maple and lime, while I took most of mine on the trunks of black poplars.

Bracondale, Norwich:
11th January, 1881.

ON FEMALE DIMORPHISM OF *PALTOSTOMA TORRENTIUM*.

BY DR. FRITZ MÜLLER.

As there seems to be some hesitation in accepting the female dimorphism of *Paltostoma torrentium* (see Ent. Mo. Mag., xvii, p. 180), I will here very briefly state the facts which seem to me to prove that the two sets of females belong to the same species.

First as to the sex of the three forms of *Paltostoma*. Were it not for Baron Osten-Sacken saying that "error may easily occur," I should have thought it quite unnecessary explicitly to state, that I ascertained the sex by examining the internal sexual organs; the females of either set have three dark brown pear-shaped *receptacula seminis*; the eggs, in nearly ripe pupæ, are 0.5 mm. long, 0.13 mm. thick, one side being more convex and one end a little more obtuse than the other.

Had the males and the two sets of females been caught at the same locality, it would indeed have been rash to consider the females (widely differing in the organs of the mouth, the size of the eyes, and the structure of the last tarsal joints) as belonging to the same species. But the case is quite different. In the rapids of some of our rivulets the larvæ and pupæ of *Paltostoma* are extremely frequent, and may be collected in large numbers. Thus I have been able carefully to compare and to dissect hundreds of them; but I have not discovered any differences corresponding to the three sets of flies. From the pupæ I have extracted repeatedly numerous flies, and have always met with two sets of females, and never with more than one set of males. The two sexes seem to occur in about equal numbers. One day from 70 pupæ I extracted 20 males and 20 females, and of these 13 had small eyes, short claws, and no mandibles, whereas 7 were provided with mandibles, and had large eyes and long claws. *The structure of the external sexual organs* (as already stated in my article in "Kosmos") *is quite the same in the two sets of females*, and this would hardly be the case, if they belonged to different species.

If the two sets of females belonged to two distinct species, unavoidably one of the two following equally unacceptable assumptions must be admitted: the males of one of the two species either must be extremely rare, so that among very numerous females I never saw them, or their larvæ and pupæ must live in different localities and under quite different conditions; the latter assumption is the more improbable, as the larvæ of *Paltostoma* are wonderfully adapted to inhabiting rapids.

I may add, that I placed the fly in the genus *Paltostoma* on the authority of Professor Brauer, of Vienna, who is also responsible for the statement, that a species of that genus has been found on Monte Rosa (see Zoolog. Anzeiger, No. 51, p. 134). I have never ventured any assumption about the eyes of other *Blepharocerida*, of which I know absolutely nothing; in the passage alluded to by Baron Osten-Sacken, I simply refer to many "other male insects" ("männchen anderer Kerfe").

A full account of the metamorphosis of *Paltostoma torrentium*, and of the very interesting anatomy of the larva, has been sent for publication to the "Archivos do Museu Nacional do Rio de Janeiro."

Blumenau, Sa Catharina, Brazil:
December 18th, 1880.

CHARACTERS OF NEW GENERA AND DESCRIPTIONS OF NEW SPECIES OF *GEODEPHAGA* FROM THE HAWAIIAN ISLANDS.

BY THE REV. T. BLACKBURN, B.A.

(Resumed from vol. xvi, p. 109).

IV.

The following species, together with examples of most of those taken in February, 1878, occurred to me in April and May, 1880, during a short visit to Haleakala, Maui.

The addition of fresh material to my series, and a consequent re-examination of the Hawaiian species of *Cyclothorax*, has led me to the conclusion that in my descriptions of *C. scaritoides*, *cordaticollis*, *Deverilli*, and *vulcanus*, the term "subcordatus" applied to the prothorax is misleading, and that "cordatus" should be substituted for it. In a batch of specimens, taken in company, of almost any of the Hawaiian *Geodephaga*, one or two examples will generally be found to differ slightly in sculpture from the rest. How to account for this fact I know not, but a fact it is; and, unfortunately, the species mentioned above were described on specimens that (I have since discovered) were not ordinary types. In other respects, however, the descriptions may stand.

ANCHOMENIDÆ.

DISENOCHUS.

[In characterizing this genus (Ent. Mo. Mag., vol. xv, p. 121), I accidentally omitted reference to the eyes. They are only slightly convex, and as indistinctly faceted as those of *Blackburnia insignis* and *blaptoides*.]

D. TEREBRATUS, *sp. nov.*

Convexus, nitidus, niger, antennis palpisque rufis, pedibus (præcipue genubus tarsisque) plus minusve rufescentibus; prothorace transverso, antice vix emarginato, postice fortius angustato, basi utrinque impresso, angulis posticis rotundatis, lateribus fortius rotundatis angustissime marginatis, margine reflexo trans basin deficiente; elytris oblongis fortiter striatis, striis parcius profunde punctatis, apicem versus obsoletis, interstitiis angustis, humeris rotundatis, metasterno punctato. Long. 8 mm.

Haleakala, Maui. Several examples occurred under stones at an elevation of about 4000 feet.

This insect is readily distinguished from *D. anomalus* by the following characters:—The thorax is considerably narrowed behind, and has the base unmarginated; the elytra are much narrower than those of *anomalus*, and the striæ are much more sparingly and coarsely punctured. The rather coarsely punctured metasternum also differentiates it.

ANCHOMENUS.

A. PUTEALIS, *sp. nov.*

(*A. meticulo affinis*). *Subnitidus, niger, nonnullis exemplis marginibus apiceque rufescentibus, mandibulis palpis antennis pedibusque plus minusve rufescentibus; capite magno; oculis magnis convexis; antennis corporis dimidio paululum brevioribus; prothorace transverso subcordato canaliculato, antice parum emarginato, basi utrinque fortiter foveolato, lateribus parum rotundatis, angulis posticis fere rectis; elytris elongato-ovalibus, parum convexis, fortiter striatis, interstitiis vix convexis, humeris prominulis; tarsorum articulo quarto haud emarginato.* Long. $7\frac{1}{2}$ —8 mm.

In damp rotting leaves on the margins of a stagnant pool, at an elevation of about 4000 feet, on Haleakala, Maui.

CYCLOTHORAX.

C. UNCTUS, *sp. nov.*

Parum convexus, nitidus, nigro-æneus, antennis palpis pedibusque lividis; capite mediocri, oculis prominulis, antennis corporis dimidio brevioribus; prothorace cordato, sat fortiter transverso rotundatoque, leviter canaliculato, antice leviter emarginato, trans basin sparsim punctato, angulis posticis acute rectis; elytris ovalis, strid internâ integrâ fortiter impressâ antice punctatâ, secundâ integrâ leviter impressâ distincte punctatâ, striarum cæteris (marginali exceptâ) obscure adumbratis (nonnullis exemplis penitus oblitteratis), humeris rotundatis. Long. $5\frac{1}{2}$ — $6\frac{1}{4}$ mm.

In company with *A. putealis*.

This species is allied to *C. cordaticollis*, *Deverilli*, and *vulcanus*. It is considerably larger, broader, and less convex than *cordaticollis*.

very much broader and less convex than *Deverilli*, and very differently striated, &c.; the strongly rounded thorax, superior size, different colour, &c., distinguish it readily from *vulcanus*.

C. *LÆTUS*, *sp. nov.*

Convexus, nitidus, nigro-brunneus ad æneum accedens, antennis palpis pedibusque ferrugineis vel rufo testaceis; capite mediocri, oculis prominulis; antennis corporis dimidio multo brevioribus, submoniliformibus; prothorace transverso, cordato, canaliculato, antice fere truncato, trans basin sparsim punctato, angulis posticis rectis; elytris ovalibus, subtiliter striatis, striis externis subtilioribus, striis antice subtiliter punctatis, humeris rotundatis.

Long. 4½—5 mm.

Haleakala, Maui; under stones, &c., at an elevation of about 4000 ft.

Another species of the *cordaticollis* group, nearest, I think, to *vulcanus*; it may, however, be easily distinguished from all its allies by the shortness of its antennæ, which, when set back, will not quite reach the base of the scutellum.

C. *ROBUSTUS*, *sp. nov.*

Fortiter convexus, subnitidus, obscure viridi-æneus, antennis palpis pedibusque rufo-piceis; capite mediocri, oculis prominulis; antennis corporis dimidio brevioribus; prothorace transverso, cordato, canaliculato, antice fere truncato, basi utrinque foveolato, trans basin punctato, angulis posticis rectis (nec abrupte); elytris ovatis, fortiter regulariterque striatis, striis antice obscure punctatis, humeris prominulis.

Long. 6 mm.

A single specimen occurred to me in moss, at an elevation of about 4000 feet, on Haleakala, Maui.

This species is not very close to any other with which I am acquainted. The combination of strong regular striation with great convexity separates it from all its congeners with the thorax of cordate form.

BEMBIDIIDÆ.

BEMBIDIUM (NOTAPHUS).

B. *SPURCUM*, *sp. nov.*

Minus convexus, nigrum ad cupreum accedens, antennis palpis pedibus et elytrorum maculâ posticâ plus minusve rufescentibus; capite mediocri, oculis parum convexis, antennis corporis dimidio longioribus; prothorace transverso, cordato, leviter canaliculato, antice emarginato, basi lato, utrinque foveolato, angulis posticis rectis; elytris oblongis, minus fortiter punctato-striatis, interstitiis planis, humeris rotundatis.

Long. 4½ mm.

Haleakala, Maui; in decaying leaves, at an elevation of about 4000 feet.

The shape of the thorax separates this insect widely from the other Hawaiian species of *Bembidium* known to me. Compared with *B. flammulatum*, Clair. (which it resembles), it is smaller and differently coloured, with the elytra less strongly striated, the striae much more conspicuously punctured and slightly tending to become fainter at the extreme apex.

(LOPHA).

B. TERES, *sp. nov.*

Parum convexum, viridi-æneum, antennis palpis pedibusque piceis (plus minusve rufescentibus); capite mediocri, oculis fortiter convexis, antennis corporis dimidio longioribus; prothorace leviter transverso, cordato, obsolete canaliculato, antice leviter emarginato, trans basin obscure rugato, angulis posticis subrectis; elytris oblongis, sat fortiter striatis, striis subtiliter punctatis, apicem versus evanescentibus, humeris rotundatis. Long. 5 mm.

Haleakala, Maui; in decaying leaves, at an elevation of about 4000 feet.

The larger size, longer antennæ, more elongate and less convex form, &c., readily distinguish this species from *B. pacificum*.

Honolulu: November, 1880.

NOTES ON THE ENTOMOLOGY OF PORTUGAL.

IV. LEPIDOPTERA (continued).

MICRO-LEPIDOPTERA (EXCEPT TINEINA) COLLECTED BY THE REV. A. E. EATON IN 1880, WITH DESCRIPTIONS OF NEW SPECIES.

BY E. L. RAGONOT.

PYRALIDINA.

PYRALIDIDÆ.

* *Herminia grisealis*, S. V., Hüb.—One, April 30th, Parque da Peña, Cintra.

Cledeobia moldavica, Esp. (*netricalis*, Hüb.).—One ♀, May 8th, hills south-west of Almodovar; one, *var. diffidialis*, Gn., June 25th, near Villa Real.

Asopia farinalis, L.—One, May 16th, near Silves.

Scoparia frequentella, Stn.—One, June 25th, in a vineyard near Villa Real.

S. angustea, Stph. (*coarctata*, Z.).—One, April 25th, on the hill side, valley of Alcantara.

* The Classification adopted is that of Staudinger and Wocke's Catalogue, 1871.

Threnodes pollinalis, S. V., *var. guttularis*, H.-S.—One, June 8th, at Cea.

Botys aurata, Sc. (*punicealis*, S. V.).—One, May 17th, hill south of Silves.

B. asinialis, Hüb.—One, April 30th, Parque da Peña, Cintra.

B. ferrugalis, Hüb.—One, May 15th, vineyard north of Silves.

Nomophila noctuella, S. V. (*hybridalis*, Hüb.).—One, May 31st, on the road to Cintra.

Stenia fuscociliaris, n. sp.—One fine example, May 17th, taken on a hill south of Silves.

This specimen (a ♀) differs from *punctalis*, S. V., by its larger size (25 millimètres), more elongate (therefore less triangular) fore-wings, which are of a dark, rich, reddish-ochreous-brown. The head, palpi, thorax and abdomen are reddish-ochreous throughout, whilst in *punctalis* the palpi are distinctly white beneath. The under-side of the wings is much darker than in *punctalis*, and the reniform stigma more distinct.

A second specimen, much worn, was taken on May 14th between São Bartholomeu do Messines and Silves.

CRAMBIDÆ.

Crambus craterellus, Sc. (*rorella*, L.).—Two specimens of the *var. cassentiniellus*, Z., May 11th, near Almodovar.

C. pratellus, L., *var. alfacarellus*, Stgr.—In this variety the fore-wings are rather broader, the second line is less angulated than in *pratellus*, and the ground colour is white, as in the ♀ of *pratellus*.

PHYCIDEÆ.

Pempelia satureiella, Mill.—A ♀ in very wasted condition, hardly distinguishable, May 16th, hill south-east of Silves. M. Millière places this species in error in the genus *Nephopteryx*, for the ♂ has pencil-like maxillary palpi, and the median vein of the hind-wings being trifold, show that the true position of *satureiella*, Mill., is after *integrella*, Stgr.

Asarta rubricosella, Stgr.—One, June 22nd, captured along a torrent at upwards of 2480 feet, on a mountain N.W. of Villa Real.

This specimen is much darker than a type from Castile; it is nearly black, and the fasciæ are very indistinct, the hind-wings blackish-brown.

Wocke in his Catalogue sinks *rubricosella*, Stgr., as well as *alpicolella*, Z., into varieties of *æthiopella*, Dup., but they are all three very distinct species, and it is impossible to confuse them.

Ethiopella is the smallest species, the wings are short, rounded on the costa and hind margin, the fasciæ are very sinuous, the discal spot distinct.

Rubricosella has more elongate wings, the apex is rather acute, the costa and hind margin straight, the bands are nearly straight, and there are two distinct blackish triangular spots, one on the inner margin before the first fascia, and the other on the costa just after the same fascia, but there is no discal spot.

Alpicolella resembles in form and markings *rubricosella*, but it is larger and more suffused with pale yellowish scales, the head in front is distinctly *pale yellowish*, the hind-wings are pale grey, whitish on the costa, the triangular markings are more sharply defined on the fore-wings, and the under-side of both wings is whitish.

Epischnia illotella, Z.—One, May 16th, on the hill S.E. of Silves.

Acrobasis glycerella, Stgr.—One, May 6th, near a stream at Almodovar.

Euzophera polyxenella, Mill. (M. Millière places this species in error in the genus *Ephestia*).—One, June 12th, taken at Ponte de Morcellos.

Homæosoma nimbella, Z.—One, May 7th, on the hill south of Silves.

TORTRICINA.

Teras logiana, S. V. (*tristana*, Hüb.).—One, May 20th, with the ground colour nearly white, resembling pretty exactly fig. 64 of Hübner, captured on the slopes of Picota, high up the stream at 1600 to 1700 feet.

Tortrix amplana, Hüb. (fig. 201, not 157 as quoted by Dr. Wocke).—One ♀, captured on April 25th in the valley of Alcantara, near Lisbon.

T. Eatoniana, n. sp.

Al. exp. 16 mm. Fore-wings rather elongate, arched at the base, the hind margin oblique. The ground colour is pale fulvous, lustrous, with a darker reticulation and suffused sometimes with reddish-ochreous; from the middle of the costa proceeds a blackish oblique fascia, which is straight to near the anal angle, where it becomes rounded.

On the costa before the apex is a blackish triangular patch, and there is a minute blackish spot on the inner margin not far from the base; sometimes the fascia is interrupted before the fold, and does not reach the inner margin.

Hind-wings greyish, indistinctly reticulated with fuscous on the upper-side, but distinctly so underneath. The fringes are all pale fulvous.

Head and thorax above reddish-ochreous, the front of the head fuscous. The antennæ are slightly serrate and pubescent in the ♂.

Eatoniana belongs to the sub-genus *Lophoderus*, all the nervures being separate, the costa not folded in the ♂, and the apex not produced. Its position would be between *politana*, Haw., and *cinctana*, S. V. It has a great resemblance to *unifasciana*, Dup.

Two ♂ captured, one, April 24th, near Lisbon, at Olivares; and the other, June 12th, at Ponte de Morcellos.

Sciaphila Wahlbomiana, L., var. *communana*, H.-S.—One, May 9th, at Almodovar; and another, May 16th, on the hill S.E. of Silves. They have both a leaden-grey ground colour, the markings are hardly darker and but faintly outlined.

Cochylis respirantana, Stgr.

Al. exp. 15 mm. Fore-wings rather elongate, the costa straight, the apex acute; the ground colour is pale yellowish-white, somewhat silvery and crossed by numerous irregular olive-yellow patches or spots, in which are more or less numerous fuscous scales, especially in the ♀. These spots form ill-defined, interrupted curved bands, the most distinct of which arise from the inner margin, one nearly in the middle, another from the anal angle, and the third along the hind margin. The costa is spotted with fuscous to the middle. The fringes are pale yellowish. Beneath, the fore-wings are blackish-brown, save the fringes, which are yellowish.

The hind-wings are fuscous above and paler on the under-side; the fringes are white. Head, thorax and palpi pale yellowish above and olive-yellow on the sides. The antennæ are pale brown, simple in the ♀ and pubescent in the ♂,

This new species, which has lately been published by Dr. Staudinger (Horæ Rossicæ, 1880, xv, Sep. abd. p. 88), resembles *dubrisana* very much (next to which species I would place it) in its markings, but differs by its colour, size, shape, and the absence of reticulations on the hind-wings, which are similar in colour in both sexes.

Dr. Staudinger has received it from Amasia, and has also taken it this year at Chiclana in Andalusia.

One ♀, May 16th, on a hill S.E. of Silves.*

Penthina (Sericoris) lacunana, Dup.—One, June 6th, at Cea. It has the median band much blacker than usual, and in the middle of the band the round spot is conspicuously light. A second example was captured in the same locality, but instead of the ground colour being olivaceous, it is reddish-fuscous like *cespitana*, with numerous lines and markings dark brown.

* I may mention here another Portuguese *Cochylis*, of which I have a specimen taken at Braganza by M. Manuel d'Oliviera.

Cochylis punctiferana, n. sp. Al. exp. 7 mill. Fore-wings much suffused with brownish-grey, leaving but little of the whitish ground colour. The base, a rather broad fascia, which begins on the costa nearly in the middle, going straight down to the median vein, then slanting towards the base and ending straight on the inner margin from the dorsal vein, and a large triangular spot on the inner margin before the anal angle, are dark greyish-brown. Between the fascia and the spot on the inner margin is a narrow white space. At the end of the median vein there is a very distinct round blackish dot surrounded with whitish; above on the costa is a small brown spot, beyond which there are two others forming a semicircle, below which there is a pale brownish cloud parallel with the hind margin. Before the apex is another small brown spot, and the fringes, which are white, are distinctly chequered above and beneath with large brownish spots at the base and extremity. The under-side is blackish-brown, spotted with dark brown on the whitish costa.

The hind-wings are dark brownish-grey above and lighter beneath, the fringes white.

This new species I place between *coagulana*, Christ., and *reversana*, Stgr., but the large size of the triangular anal patch and the discal spot distinguish it easily from all the allied species.

Grapholitha sordicomana, Stgr.—Four ♂, May 6th, at Almodovar, but all much wasted; two are suffused with reddish, especially towards the costa. The whitish colour of the hind-wings beneath is very characteristic of this species.

Dr. Wocke, in noting for his Catalogue the species described in Herrieh-Schäffer's "Neue Schmetterlinge aus Europa, &c.," has omitted this (p. 15, fig. 94), with quite a number of others; I mention this for those who possess this useful work.

G. succedana, S. V. (*ulicetana*, Haw.).—Two, April 30th, in the Parque da Peña, near Cintra; one with the uniform grey ground in the variety named *micaceana* (Constant).

G. coniferana, Ratz.—One, June 14th, on the hill side opposite Ponte de Morcellos.

Phoxopteryx diminutana, Haw.—One, June 11th, near Cea.

PTEROPHORINA.

Amblyptilia acanthodactyla, Hüb.—One, May 8th, on the hill S.W. of Almodovar.

Leioptilus osteodactylus, Z.—One, May 14th, near Silves.

Aciptilia icterodactylus, Mann.—One, much wasted, June 24th, on the hills to the west of Villa Real.

To finish, I must express here my best thanks to the Rev. A. E. Eaton for having kindly authorized me to retain for my collection the specimens which interested me.

12, Quai de la Rapée, Paris :
November 20th, 1880.

DIAGNOSES QUATUOR NOVARUM PENTATOMIDARUM.

SCRIPSIT DR. O. M. REUTER.

CARBULA AMURENSIS.

C. humigeræ, Uhler, *magnitudine coloreque simillima, pronoti angulis lateralibus obtusioribus haud in dentem productis et margine postico rectis, hoc margine inter costam et scutellum tantum paullulum brevior necnon scutelli apice magis attenuato, distincta.*

Habitat in Amuria.

CARBULA OBTUSANGULA.

Præcedenti valde similis, differt pronoto minus transverso, angulis lateralibus adhuc obtusioribus, apice ipso distincte obtusis, margine antico laterali versus angulum fortius arcuato; antennarum articulo quarto versus apicem fuscescente, quinto fusco, versus basin pallido, nec non segmentis connexivi tantum angulo apicali, macula parvula nigra, signatis, basali puncto nigro destitutis.

Habitat in China.

EDESSE FUSCIDORSATA.

E. saturatæ, Dall., *affinis*, differt cornubus pronoti fere paullulum longioribus, dorso abdominis fusco, connexivi angulis multo latius nigris, macula media inter has, angusta, lutea, ventre obscure olivaceo-brunneo, colore supernæ obscure viridi.

Habitat in Mexico et Bogota.

ASPONGOPUS NIGROÆNEUS.

Totus nigro-aneus; capite, pronoto et scutello dense subtiliter punctatis, rugis transversis obsoletis; capitis lateribus distincte sinuatis; antennis articulo secundo primo paullo magis quam dimidio longiore, secundo et tertio compressis, hoc illo distincte longiore (ultimi desunt); corio margine apicali leviter rotundato; prosterno medio triangulariter impresso, marginibus impressionis vix reflexis. Long. $16\frac{1}{2}$ mm. Ab *A. ochreo*, Westw., colore, prosterni impressione minus profunda, punctura densiore, rugis vix distinguendis divergens.

Habitat in Siam.

Helsingfors: January 21st, 1881.

Captures of Hemiptera in 1880.—During a three-weeks' stay last August at Wymondley, Herts, I found bugs by far the most abundant of all Orders. Nettles yielded the following species in the utmost profusion:—*Scolopostethus affinis*, *Lygus pabulinus*, *Spinola* and *Kalmii*, *Byrsoptera rufifrons*, *Orthotylus Scotti*, *Heterotoma merioptera*, *Plagiognathus arbustorum*, and *Anthocoris nemorum*; while *Sehirus bicolor*, *Phytocoris ulmi*, *Capsus lanarius* and *Liocoris tripustulatus*, occurred commonly. *Megalocera longicornis* was common amongst coarse herbage, but *M. erratica* was conspicuous by its almost total absence in either larval or perfect form. Of the handsome genus *Calocoris*, besides *C. roseomaculatus* and *bipunctatus*, I took 2 *fulvomaculatus*, 1 *sexguttatus*, 1 *infusus*, and a few *chenopodii*, all by sweeping. *Ononis* yielded *Dicyphus annulatus* commonly and a few *Macrocoleus Paykullii*. On *Epilobium hirsutum* I found in great abundance a pale green *Dicyphus*, which Mr. Edward Saunders tells me is *D. stachydis*, Reut.; I have since found it on the same plant at Hastings. A small patch, a few square yards in extent, in a flowery meadow on the chalk near Stevenage, yielded, besides a lot of ordinary things, *Halticus apterus*, *Orthocephalus saltator*, *Anoterops setulosus*, *Macrocoleus molliculus*, *Megalocera ruficornis*, plenty of *Calocoris roseomaculatus*, and immense numbers of *Monanthia cardui*, the thistle-heads being absolutely swarming with the last, in all its stages. A larch plantation afforded 1 *Atractotomus magnicornis*, Fall., and several *Tetraphleps vittata*, larval and adult. Amongst other things may be mentioned *Malacocoris chlorizans*, very common on hazel; *Triphleps minuta*, abundant by sweeping; 1 ♀ *Microphysa elegantula*, on lime-bark; 1 *Pæciloscytus nigratus*, 1 *Orthotylus bilineatus*, and a few *Chlamydatus ambulans*, *Campyloneura virgula*, *Nabis brevipennis*, *Dictyonota crassicornis*, and *Derephysia foliacea*. I am indebted to Mr. Edward Saunders for the names of some of the above. At Battle, near Hastings, *Strachia festiva* was common in September,

though we have never seen it at Hastings. From Eastbourne Miss R. M. Sotheby sent me a specimen of *Rhacognathus punctatus*, and I received *Coranus subapterus* from Deal.—E. A. BUTLER, University Lower School, Hastings: Feb. 14th, 1881.

Notes on Coleoptera in the Isle of Wight.—Last spring, during a few days' stay at Ventnor, I obtained a good many specimens of *Lithocharis maritima* (first recorded as British from this locality by Mr. Guyon). I found the first specimen by accident, while searching for *Limnæum nigropiceum* which was fairly plentiful. At first I took the *Lithocharis* very sparingly, but afterwards, on acquiring a knowledge of its habits, I succeeded on one occasion in getting about two dozen in less than an hour. *Philonthus xantholoma* swarmed in the same locality, a considerable number of the var. *variolosus* with abnormally developed heads being among them. *Philonthus fucicola* was to be got, but sparingly, and also *Philonthus sericeus*, and *Homalota vestita*, *plumbea*, and *puncticeps*.

Dianous and *Stenus guttula* can always be found under the moss in the stream that runs down to the beach a little to the west of the town. I failed, however, to find *Trechus lapidosus* under the stones near the same place, though I secured a few there two years before.

At Sandown I found several *Harpalus parallelus*, and other common *Harpali* (such as *rotundicollis*, *rubripes*, &c.) in abundance; also *Ceuthorhynchus rugulosus*, *Ceuthorhynchideus Dawsoni*, and *Apion confuens* (the latter in profusion, always in company with *Olibrus æneus*) on and at the roots of plants growing in the sand.

I tried Black Gang Chine one day, but failed to get any beetles worth mentioning except *Apion striatum* and *Philorhinum humile*, both in abundance, off furze.

There was a bitter east wind blowing all the time I was in the Island, which rendered sweeping and beating out of the question, except in unusually sheltered spots.—W. W. FOWLER, Lincoln: February 2nd, 1881.

Colorado Beetles in Devonshire.—In the House of Commons, on the 11th inst., Mr. Borlase asked the Secretary of State for the House Department whether his attention had been called to the evidence adduced at the Yealmpton Police-court, with regard to the discovery of Colorado beetles in South Devon; and Mr. Mundella said he had been requested to answer this question, Colorado beetles being in his department. The history of the case referred to was as follows:—On the 5th inst. the deputy chief constable of Devon telegraphed to the clerk of the Council that a man near Plymouth was in possession of some live Colorado beetles, which he refused to give up, that there was no power to apprehend, and asked for instructions. A telegraphic reply was immediately sent to the effect that the Destructive Insects' Act of 1877, and the order passed under that Act, provided for the imposition of penalties in such cases. Copies of the Act and order were forwarded to him by that night's post. On the 7th inst. the Home Office sent us a letter from the clerk of the justices of the Petty Sessions Division on the subject. We gave him the same information as was given to the deputy chief constable. On the 10th inst. we received an intimation that the defendant had been convicted and fined £5, the maximum penalty of £10 having been mitigated, as he pleaded ignorance of the law, and proved that the beetles had been destroyed.

[From the "Gardeners' Chronicle" for February 19th, 1881. We understand

the beetles were brought alive from America by their possessor; the Devonshire farmers are said to be much dissatisfied at the small amount of the fine.—EDS.]

Prices of rare exotic Coleoptera.—At the sale at Stevens's rooms on the 11th February, of the collection of *Coleoptera* formed by the late Mr. J. Aspinall Turner (formerly M.P. for Manchester), the following prices were obtained for some of the most conspicuous lots. Lot 61, consisting of 2 *Euchirus Dupontianus*, 2 *E. Macleayi*, 3 *E. Cantori*, and 3 *E. Hardwickii*, realized £8. Lot 91, 2 fine *Goliathus giganteus*, sold for £7. Lot 92, 1 *G. giganteus*, 1 fine *G. Kirkii*, ♂, and 1 probable variety of the ♀ of *G. cacicus*, sold for £20. Lot 95, a fine and perfect *Ischnoscelis Dohrni*, fetched £10. Lot 96, 1 *I. Dohrni* and 7 *Ceratorrhina setulosa*, fetched £7. Lot 97, a fine pair of *Goliathus Fornassinii*, realized £24. Lot 101, 1 *Ceratorrhina Savagei* and 2 *C. Polyphemus*, sold for £5 10s. Lot 149, *Hypocephalus paradoxus*, sold for £10. Lot 154, a pair of *Macrotoma Hayesii* and other good *Prionide*, realized £8. The general opinion appeared to be that rarities fetched extreme prices, whereas fine sets of more ordinary species sold very cheaply.

Notes on Mr. Saunders' Synopsis of British Heterogyna and Fossorial Hymenoptera.—

Tapinoma polita, Smith. Bournemouth; one specimen (♂), J. C. Dale. Not Wales. The late Mr. Smith misread Bournemouth as Barmouth.

Additional localities—

Ponera contracta, Latr. Ventnor, Deal, C. W. Dale.

Leptothorax acervorum, Fab., appears to me to be as much a southern as a northern species, as it is common in both Hampshire and Dorsetshire.

L. unifasciata, Latr. Rare. Isle of Wight, Seaton, Portland, and Lulworth, C. W. Dale. Not Sherborne.

Myrmecina Latreillei, Curt. Several places in Dorsetshire and Hampshire.

Aporus unicolor, Spin. Very rare. Middlemarsh, Dorset: one, J. C. Dale, 1835.

Priocnemis hyalinatus, Fab. Parley Heath.

Agencia variegata, Linn. Rare. Glanvilles Wootton, Portland.

Didineis brevicornis, Fab. Bristol, Walcot; Glanvilles Wootton, Lulworth, Dale.

Crabro aphidum, St. Farg. Herne, Hants, J. C. Dale, ♂ ♀, July 25th, 1842.

C. signatus, Panz. Glanvilles Wootton, ♂, C. W. Dale, June 20th, 1867.

Oxybelus mandibularis, Dbm. Appledore, Devon, J. C. Dale, July 21st, 1831.

—C. W. DALE, Glanvilles Wootton, Sherborne, Dorset: *February*, 1881.

An Ichneumon new to Britain (Mesolius rufilabris).—At Wymondley I took, in August, two specimens of a fine ichneumon which Mr. Fitch has named for me, *Mesolius rufilabris*, Zett., new to Britain.—E. A. BUTLER, Hastings: *February 14th*, 1881.

Ophion minutum at Hastings.—I have to record the capture of a specimen of *Ophion minutum* (vide *The Entomologist*, vol. xiii, p. 54), at Hastings during the past season. It has been identified by Mr. Fitch.—F. WALTER SAVAGE, University School, Hastings: *February*, 1881.

Vespa norvegica in Yorkshire.—On August 11th last, while collecting *Coleoptera* on umbelliferous plants at Stamford Bridge near York, I captured a specimen of *Vespa norvegica*.—W. W. FOWLER, Lincoln: February 8th, 1881.

Ornithoptera Brookeana, Wall.—This handsome butterfly, which was first described by Mr. Wallace in 1855, and discovered by him in the neighbourhood of Saráwak, is still, especially the female, not a common insect in collections, but, from recent information, it appears to have a much wider habitat than is usually understood, and, therefore, also likely before long to be estimated as a much less rare insect by Lepidopterists. Of its having but a limited range in Borneo it would be somewhat rash to predicate. From Saráwak, where originally found, it extends northwards to Sandakan where it has been captured by Mr. W. B. Pryer, and was seen in N.W. Borneo, near Mt. Kina Balu, by Mr. Burbridge, "Gardens of the Sun," p. 260. This author records it as being seen in considerable numbers: "These delicate insects are generally most numerous by rivers, or in sunny places by the dry beds of streams, and, singularly enough, are most abundant during the cool wet monsoon." It is also found in Sumatra, Vollenhoven having described and figured it from that Island under the name of *P. Trogon*. In the Proc. Roy. Geog. Soc., vol. ii, p. 634, it is recorded that Mr. Leech found this butterfly "plentifully in several places" in Eastern Pérak. It is thus found in Malacca, Sumatra, and Borneo, but we may almost absolutely say not in Java, and thus agrees with the many other zoological coincidences which prompted Mr. Wallace some years since to propound the theory "that subsequent to the separation of Java, Borneo became almost entirely submerged, and on its re-elevation was for a time connected with the Malay Peninsula and Sumatra, but not with Java or Siam." Most of the described *Ornithoptera* are now in collections; *O. Urcilliana* has recently been received from Duke of York's Island, and the greatest rarity and desideratum that remains is *O. Tithonus*, De Haan, which was described and figured in 1840.—W. L. DISTANT, East Dulwich: January 22nd, 1881.

Occurrence of *Harpella bracteella* near Hartlepool.—Mr. J. E. Robson, of Hartlepool, took a specimen of this rare Micro., in his garden, last summer. The insect flew to light, which was put in his summer-house for the purpose of attracting moths. It is in rather poor condition, but a most interesting capture, as giving a fresh locality for the species. The only other recorded captures are those near Gateshead, and the one at Crumlyn by Mr. Scott. Mr. Robson most kindly presented me with the specimen.—J. SANG, 6, Chestnut Street, Darlington: January 25th, 1881.

On the semi-looping habit of young larvæ of Noctuæ.—In reference to Mr. Stainton's remarks (*ante* p. 135) on the half-looping young larvæ of *Triphæna pronuba*, I have to state that, according to my experience, which has been pretty extensive in rearing from the egg, nearly all the larvæ of the *Trifidæ* are semi-loopers when first hatched. The *Cymatophoridaæ* are an exception, but they are altogether abnormal, and somewhat allied to the *Tortricina*, the eggs being pear-shaped, and the larvæ living between united leaves and moulting only four times, while the normal number of moults in the *Trifidæ* is five.—R. F. LOGAN, Colinton, N.B.: February 11th, 1881.

Pempelia hostilis, &c., near Colchester.—I captured a worn specimen of *Pempelia hostilis* in 1879, and in the autumn of that year took several larvæ, but

only succeeded in breeding one specimen last June. On May 29th however, I took a lovely example by beating. I should have announced the capture of this rare species before, but could not fully satisfy myself about it and delayed submitting my specimen to a more competent authority. In the autumn of last year I again met with several larvæ, and hope to see the perfect insect in due course. It seems very scarce and local, for though aspen abounds in most of the larger woods hereabouts, I have only found *hostilis* in one locality, though I have searched for it well elsewhere.

At the end of last September, when beating oak, a considerable number of another "knot-horn" larva tumbled into my umbrella. These I at first hoped might be *Cryptoblabes bistrigella*, but they were so common that it struck me they might more probably be young larvæ of *Rhodophaea consociella*, which is abundant in the locality; I therefore only boxed about a dozen. Some of these were ichneumonised, but others became pupæ later on, thus proving that they could not be *consociella*, and driving me back to the conclusion that my first impression was most likely correct.

Bistrigella generally turns up here every season, but is always very rare in the perfect state. I also met last autumn with *Gymnancyla canella*, the larvæ of which were tenanting several plants of *Salsola kali* on a retired part of the Essex coast.—W. H. HARWOOD, 8, West Stockwell Street, Colchester: 14th February, 1881.

On the Stridulation of Acherontia.—Dr. Laboulbène takes exception, in the "Annales de la Société Entomologique de France" (5me Série, t. vii [1877], Bull., p. 1v), in regard to my failing to quote a paper he had published on the stridulation of the Death's-Head Sphinx, when I, in reply to Mr. Moseley, tried to establish the mechanical nature of this sound in the Ent. Mo. Mag., vol. xiii, pp. 217—220. His experience is as follows:—"Eventually I wished to see in what manner the animal arranged the fan of hairs lying in the fold. This fold is formed of a dry rough skin (*comme scarieuse*), especially at the margin of the first segment where it rests on the second. I passed beneath this dry skin the blunt point of a little steel rod, and not only did I succeed in thus arranging the hairs, but, to my satisfaction, I heard a sound, feeble, but very similar to the cry of the living animal. I repeated the same manœuvre, by pressing on the skin behind the fold and a little higher up on the first segment, and every time I caused the hair to fall into its place almost invariably I elicited the cry. The reason of this appeared attributable to the contraction of the muscles as they shut the fold with its dry membrane, and perhaps also to the friction of the rough skin of the first abdominal segment on the second."

As the Death's-Head Sphinx has not been common in this district since the autumn of 1878, I have not been able to make further observations on its cry, but if the true sound can be elicited as Mons. Laboulbène would affirm, I perhaps may suggest that I find a much more suitable structure for its production in the hinder pieces of the meso-sternum, which on their inner surface are distinctly limaform.—A. H. SWINTON, Binfield House, Guildford: 3rd February, 1881.

Review.

A TREATISE ON COMPARATIVE EMBRYOLOGY: by FRANCIS M. BALFOUR, M.A., F.R.S., Fellow and Lecturer of Trinity College, Cambridge. 8vo, 2 vols. Vol. I, pp. v—vii, 1—492, and i—xxii. London: Macmillan & Co., 1880.

An extremely useful summary of what is known on this subject at the present time, judiciously arranged and well illustrated with woodcuts. Although Entomo-

logists, as a rule, are more familiar with Comparative Morphology than with Embryology, there is much in this volume well worthy of their consideration. Prefaced by a short Introduction (pp. 1—13) explanatory of the science and aims of Embryology, and describing the methods of animal reproduction in their general plan, the first three chapters treat of the ovum and spermatozoon, giving a general and special account of their formation, and of the development of the former up to the period of its segmentation after impregnation. The distinction drawn by Huxley between *ova* and *pseudova* is not adopted; and "the term nurse (German Amme) employed for the asexual generations in metagenesis, may advantageously be dropped altogether."

The remainder of the volume is occupied by Systematic Embryology, Part I, introduced by an explanation of what takes place in the ovum after segmentation has been completed, a chapter being devoted to the Embryology of each class of animals (excepting the classes of the Vertebrata, which are to form the subject of Part II in the second volume), in addition to chapters relating to animals whose affinities have not yet been exactly ascertained, the matter being discussed chiefly from an histological point of view. The chapters of most immediate interest to Entomological students extend from p. 316 to p. 452, and relate, XVII to *Tracheata*, XVIII to *Crustacea*, and XIX to *Pacilopoda*, *Pycnogonida*, *Pentatomida*, and *Tardigrada*, concluding with a summary of Arthropodan development.

At pp. 451—452, Mr. Balfour advances embryological reasons adverse to the opinion prevalent amongst Zoologists, that *Tracheata* and *Crustacea* are members of the same phylum, and maintains that the *Arthropoda* have a double phylum,—the *Tracheata* descended from a terrestrial Annelidan type related to *Peripatus*; and the *Crustacea* from a Phyllopod-like ancestor. In support of these, he adduces others based upon the anatomy of the animals in some particulars, pointing out that "the Crustacean appendages are typically biramous, while those of the *Tracheata* are never at any stage of development biramous." He does not admit that bi-flagellate antennæ in *Pauropus* (no other instances are cited) constitute an exception to this rule, maintaining (p. 337) that antennæ "can hardly be considered to have the same morphological value as the succeeding appendages. They are rather equivalent to paired processes of the præoral lobes of the chætopoda;" or, if equivalent to appendages, they may correspond with the first pair of antennæ of *Crustacea*. This rule (that no appendages are biramous in *Tracheata*) having thus been conclusively decided, it might be unkind to enquire, what is to be done with the upper maxillæ of such creatures as *Lucanus*, for example? not to mention *Perilida*, &c., whose galea is jointless.

The author justly alleges (p. 451) that "the similarity between the appendages of some of the higher *Crustacea* and those of many *Tracheata* is an adaptive one, and could in no case be used as an argument for the affinity of the two groups;" whilst in respect of some other resemblances between them, they are due to "both groups being descendants of Annelidan ancestors." The similarity of the compound eyes in the two groups cannot, however, be explained in this way, and is one of the greatest difficulties of the above view.

In arguing against the supposition entertained by Gegenbaur and Lubbock, that in the *Ephemerida* and *Trichoptera* the tracheal gills are modifications of wings (p. 339), the strong point that these organs are in several instances developed

from the ventral region of the abdomen, the under-side of the thorax, and beneath the head from the hinder part of the basal joining of the upper maxilla, is not advanced by Mr. Balfour.

In fig. 188 A, illustrating aquatic respiration (after Gegenbaur) the original author's blunder over the name of the insect has been reproduced. The figure is a sketch of the abdomen of a nymph of *Cloëon rufulum* (the *Chloëon dimidiatum* of Lubbock's writings), the species being precisely indicated by a peculiarity in the form of its tails, whereby it is distinguishable from the other German species of the genus. It is named, however, *Ephemera vulgata*, an error which might have been avoided by reference to Pictet's Monograph. It is adding insult to injury to give bad names to an insect that has been subjected to the miseries of being drawn alive under the microscope; but it is a way some people have of showing their contempt for creatures not so large as whales, and not so small as mites. Very likely Gegenbaur, in the present instance, was misled by Wagner in "Isis" for 1832, pl. ii, 1.

Reasons are given (p. 376) for considering the antennæ to be unrepresented in *Arachnida*, the chelicerae being homologues of the mandibles, the pedipalpi answering to the 1st maxilla, and the 1st pair of ambulatory limbs to the 2nd maxillæ of Insecta. The telson is reckoned as a segment.—A. E. EATON.

Obituary.

Gabriel Koch.—On the 22nd January, 1881, in the 74th year of his age, this Frankfort Entomologist departed this life. He had amassed a very fair collection of *Lepidoptera*, and from time to time had published sundry memoirs on this Order of insects—of these by far the most interesting is the 8vo volume of 154 pages, which appeared in 1854, on the Geographical Distribution of European *Lepidoptera* in other parts of the globe: "Die geographische Verbreitung der europäischen Schmetterlinge in andern Welttheilen, nebst statistischen Tabellen." This work was noticed at the time it appeared in the Entomologist's Annual for 1856, p. 153.

In 1856, Koch published a larger work extending to nearly 500 pages: "Die Schmetterlinge des südwestlichen Deutschlands, insbesondere der Umgegend von Frankfurt, Nassau und der Hessischen Staaten, nebst Angabe der Fundorte und Flugplätze." A work which no doubt has proved very useful to many a young collector in Western Germany.

His latest publication on the geographical distribution of *Lepidoptera* appeared in 1870, in Petermann's "Mittheilungen," as appears from the 8th volume of the Royal Society's Catalogue of Scientific Papers.

ENTOMOLOGICAL SOCIETY OF LONDON: Annual Meeting, 19th January, 1881.—
Sir JOHN LUBBOCK, Bart., M.P., &c., in the Chair.

The following were elected Members of Council for the ensuing year, viz.:—
Messrs. W. Cole, W. L. Distant, E. A. Fitch, F.L.S., F. Du Cane Godman, F.L.S., F. Grut, F.L.S., W. F. Kirby, R. Meldola, F.C.S., F. P. Pascoe, F.L.S., O. Salvin, M.A., F.R.S., E. Saunders, F.L.S., H. T. Stainton, F.R.S., R. Trimmen, F.L.S., and Sir John Lubbock, Bart., M.P., &c.

The following Officers were subsequently elected: President, H. T. Stainton; Treasurer, E. Saunders; Librarian, F. Grut; Secretaries, E. A. Fitch and W. F. Kirby.

An Address was read by Sir J. Lubbock, the outgoing President, and the Meeting terminated with the usual votes of thanks to the Officers, &c.

TROPICAL NOTES.

BY W. B. PRYER.

I have lately been reading, with much interest, several descriptions of scenes, principally zoological, in the Far East, but I must say that, as a rule, I consider these descriptions overdrawn. There is, of course, a broad distinction to be made between writers of the Jules Verne school and gentlemen who are really describing what they have seen in the Tropics, but even these latter are nearly always too florid; again and again I have found people writing what they believe to be true, from which home-stayers in England would suppose that the scenes commonest in the Tropics are one gorgeous conglomeration of richly hued birds, the most beautiful exotic flowers, and troops of monkeys, while snakes, squirrels, palmtrees, and, more particularly, butterflies—nearly every writer insists upon large quantities of gaily coloured butterflies—are thrown in *ad libitum*; Wallace very much put an end to the idea of the abundance of flowers in the tropical forest, and, of late years, there has been a noticeable falling off in their size, profusion, and colouring!; but most of the other things I have mentioned are still alluded to in undiminished numbers and gorgeousness.

Now, at this moment, I have "The Tropical Forest" before me; within one hundred yards of me, at this present moment of writing, commences a mighty forest, which may be traversed for a hundred miles without a vestige of human handiwork being met with, and what is it like? Simply, large quantities of straight tree-stems, running up like ships'-masts into the air, and terminating in a small mushroom-shaped head of leaves, and so thickly do the trees grow, that their heads are so closely packed together, as to form a dense canopy overhead, through which the sun can hardly find a chink to penetrate, and, accordingly, it is quite gloomy, cool, and damp below; as for monkeys, squirrels, birds, butterflies, palm trees, flowers, &c., there is simply not one visible.

Notwithstanding this, however, it does sometimes happen that one sees a good many birds in one place, in another, perhaps, a flock or two of monkeys, and, possibly, some other animal in another, a good many butterflies, and so forth; and it is but natural, perhaps, that writing afterwards while the usual uneventful every-day appearance of the Tropics is forgotten, these more beautiful and full-of-life scenes alone dwell in the memory, and are described as the usual thing.

Gifted with a good digestion and a stout pair of legs, there are, I daresay, few, if any, people who have wandered over the extreme

Far East more than I have; and the most part of my journeyings have been on foot, or in small boats, and, as far as my experience goes, the Tropics cannot compare in the smallest degree with the temperate zone for profusion of butterflies, flowers, and birds. I have described in one of your back numbers (E. M. M., vol. xiv, p. 54) the azalea-clad hills of the Snowy Valley, in the "Central Flowery Land," and never anywhere throughout all my wanderings in tropical forests have I seen anything that in the slightest approached that Paradise for naturalists.

The forest of the Philippines is the most impressive I know, the canopy of leaves is thicker, and, therefore, the gloom below more intense, the air feels a chillier damp, and the absence of life and sound is more complete than in any other forest I have been in; butterflies, in particular, are never found under the forest canopy. In Borneo, the canopy overhead is not quite so dense, the air is a trifle warmer, occasionally a monkey, a squirrel, or a bird may be seen, and, possibly, some errant specimen of the *Satyridae* may be found wandering about even in the true forest. In Malaya proper there are lots of old re-grown clearings; the air is a moist heat; the vegetation is in huge masses, much more luxuriant than in either of the others; and that feeling of mysterious awe, which is in reality the real attraction of the tropical forest, is not nearly so much felt. But wherever he may be going, the inexperienced entomologist in the Tropics must not expect too much at first, until he has found out the nooks and corners most frequented by his game, for butterflies in the Tropics are not to be found everywhere, but have their favourite places, as well as those in England. I remember my first day's entomologizing in North Borneo: no other insect-hunter had ever been within a couple of hundred miles of the place; there was dense forest all round, the weather was fine, I was in the middle of the *Ornithoptera* country, and, armed with a net of most portentous dimensions, and with my head full of thoughts of two or three new *Papilios* at least, I plunged into the forest.

Three hours later I was back at the steamer again, a wiser, at all events, if not a better man, but anyhow, a pound or two lighter! I had tried the open, and I had tried the forest; I had penetrated into the depths of a mangrove swamp, and I had been bemired in a "nepa," then I tried the edge of the jungle, and afterwards some re-grown land, all in vain! and, positively, when I got on board, my collecting box contained but one specimen of the universal *Melanitis Leda*, and a battered and washed-out *Neptis*, which looked as though it might have been the abundant *N. Eurynome* when fresh; and these were the only

butterflies I had seen! An hour's sojourn beside a gorse bush on Hampstead Heath would have afforded more—and brighter coloured—specimens than this!

As for birds, Narseer and his brother, whose fame has been celebrated by Mr. Sharpe, and their boys, over a space of twenty days did not average more than two birds each a day; and yet the result when sent home has, I daresay, caused the casual observer to exclaim: "What an abundance of beautiful birds there must be in those parts!"

I do not know whether I am specially unfortunate, but once, and once only, in all my travels, did I see butterflies in anything like that profusion that most zoological travellers seem to consider the usual thing: it was in the centre of the Malay peninsula, at a place called Chindrass, a road had been made across a marsh, and at a rather damp place, the ground was simply covered with butterflies, busy sucking at the moisture; there were not many species, but the number of specimens was something enormous, the commonest was an orange-coloured, elongate-winged *Pieris* and a *Papilio*, closely allied to *P. Rhadamanthus*, was also in large numbers; looking over the lot I picked out a *Charaxes* as a desideratum, and, on popping the net over it, took about a dozen of the common *Pieris* as well, while a whole cloud rose into the air.

In one of these papers I have mentioned* notice is taken of the apparent scarcity of caterpillars in the Tropics; this is quite true, the same thing has struck me: beat, sweep, or look where you will, there are none to be found, but they are not far off all the same, for, plant vegetables on any newly-reclaimed piece of ground, and you will have the greatest difficulty in preventing their being destroyed by swarms of larvæ. We must fall back upon Darwin for the reason, I suppose; it is only those larvæ that are peculiarly gifted with modes of concealment that have any chance of surviving the continual search made after them by numerous enemies. Large quantities of larvæ entail large quantities of moths, and large quantities there are in some more favoured localities; in a very new clearing, where butterflies are almost absent, moths are usually very abundant, and this I ascribe to the bats, like the butterflies, not yet having found their way there; when first I opened up the jungle down here, the floor of the house was absolutely littered of a morning by the quantities of moths'-wings lying about; attracted from underneath the forest cover by the light, they had flown into the house which then had no windows or doors,

* Mr. Kirby's Translation of M. C. Pieper's remarks on the habits of butterflies in the East Indian Islands.

taken refuge in the "attaps," and there been eaten by numerous enemies of all orders, from hunting spiders to rats; there are plenty of bats flying about now, and I rarely see above half-a-dozen moths in an evening. Should any one wish to try this method of collecting, I would recommend him to make his clearing some four or five miles from any open space. I felled jungle, and made a little bungalow for myself at a place about half a mile from an old "campay," and expected to see lots of moths, but the bats found their way over at once; at first I had a few moths, eight or ten or so, fly in of an evening, even these were usually of the most insignificant looking character (though one, at least, was not: I enclose picture of it, which I shall be much obliged if the editors will name for me*), and latterly there were few or none at all.

When I came out here, the late Mr. Smith was anxious to know if I could get any information as to the reputed light-producing power of the *Fulgoridæ*. All my evidence is entirely to the negative; the Indians know no light-giving insect but the common fire-fly, and I have kept some of the family alive for days, and watched them closely, but have never seen the slightest luminosity about them.

With regard to the discussion at the Entomological Society on the 4th February, 1880, about fire-flies, Sir S. S. Saunders was entirely in the right; that the intermittent character of the fire-flies' light should be doubted would be looked upon by the poorest native with much the same amusement with which Englishmen hear Frenchmen aver that the sun never shines in England. The commonest observer on any of the most ordinary lines of travel cannot but notice this: a bush, generally some kind of low mangrove, will have thousands of fire-flies on it, and the nearest parts of the adjacent bushes, also within a radius of ten feet, will have their hundreds down to scores: their light all disappears and re-appears as though it was the action of one insect, a singular and most striking phenomenon. Mr. McLachlan seemed to think that fire-flies flew together in swarms, and, therefore, suggested the theory that a slight current of air altering the position of the whole swarm at once, so that their light-producing surface could not be seen, accounted for the supposed intermittancy. In the first place, I, at all events, have never seen fire-flies swarm when flying; as far as my own observations go, they always fly about singly. Secondly, place a fire-fly in any position you like, you cannot obscure its light; even if you wrapt it up in anything so that the portion of the body giving forth the light was even partially obscured, still the light would be visible.

* This drawing was not received.—Eps.

The flight of the fire-fly is somewhat flickering and uncertain, it seems to move about in an objectless sort of way, the light disappearing and re-appearing at intervals of less than a second, though sometimes they show the light for longer periods, and, occasionally, I notice that it is not extinguished at all. When running up a pane of glass, the alternations of light and darkness are very rapid, five or six times in a second. When two fire-flies happen to fly side by side for a short distance, their light is not simultaneous, nor is it, either, if only a dozen or so are scattered over one bush, to do it properly a whole congregation is required, then they sit down altogether, do not move, and produce and extinguish their light in unison, apparently for the fun of the thing.

Elopura, Borneo :
12th December, 1880.

DESCRIPTION OF A NEW SPECIES OF *LYCENIDÆ* FROM PENANG.

BY W. L. DISTANT, V.P.E.S.

IOLAUS (PURLISA) GIGANTEUS, n. sp.

Above, brilliant cerulean-blue. Anterior-wings: costal margin, to about one-third from base, broadly hoary-grey, remainder of costal margin, apical third and outer margin, dark fuscous. This dark fuscous portion occupies rather more than one-third of the wing, commencing at costa it is curved downwards past end of cell, gradually narrowing and terminating near posterior angle on inner margin. Posterior-wings bi-caudate, with the outer margin broadly dark fuscous, terminating at anal angle with a lunulate fuscous spot, irrorated with blue scales, outwardly margined with white, followed by the dark line separating the fringe, which is white. Tails fuscous, bordered with white fringe. Abdomen and inner margin of wings hoary and pilose.

Beneath, smoky-grey, both wings crossed by a submarginal narrow dark fascia, commencing about mid-way between end of cell and margin, which is sharply defined outwardly, and evanescent inwardly, waved, but entire on anterior-wing, but deeply sinuate towards apex of posterior-wing; a pale marginal border containing some obscure lunulate marks on anterior, and a double row of smoky sub-lunulate marks on posterior-wing; a black spot faintly margined with blue before base of first tail, and a larger spot of the same colour at anal angle. Fringe of the anterior-wings concolorous, of the posterior white.

Exp. of wings, 52 mm.

Hab.: Penang.

This fine species, which I have lately received from the above locality, was not known to me when collecting there a few years since. The only other specimen which I have seen is a mutilated one, without locality, which has been in the collection of Mr. F. Moore for the last twenty years, and which he tells me frequently excited the interest of himself and the late Mr. Hewitson. *Purlisa* is the name of a genus in MS., which Mr. Moore has proposed for the reception of this species.

Selston Villas, Derwent Grove, East Dulwich :
March, 1881.

NOTES ON THE ENTOMOLOGY OF PORTUGAL.

V. LEPIDOPTERA (continued).

MICRO-LEPIDOPTERA (TINEINA) COLLECTED BY THE REV. A. E. EATON IN 1880.

BY H. T. STAINTON, F.R.S.

TINEINA.

TINEIDÆ.

Tinea (Blabophanes) imella, Hüb.—One, April 24th, near Olivæes, in the environs of Lisbon.

Tinea fuscipunctella, Haw.—One, May 10th, in the estalagem at Almodovar.

T. pellionella, L.—One, June 11th, by the streamlet near Cea.

T. chrysopterella, H.-S.—One, rather worn, May 14th, between São Bartholomeu do Messines and Silves, by the road-side in cultivated lands.

Tinea (Tineola) crassicornella, Zell.—Two fine specimens, May 16th, hill S.E. of Silves, and May 17th, hill S. of Silves, amongst dwarf-oak in the evening.

Nemotois Latreillellus, Fab.—One ♂, in fine condition, May 23rd, on the hill-side, near São Marcos da Serra.

MICROPTERYGIDÆ.

Micropteryx mansuetella, Zell.—One, June 11th, by the streamlet near Cea.

HYPONOMEUTIDÆ.

Anesychia funerella, Fab.—One, June 29th, at the stream at bridge below Ruivães.

Prays Curtisellus, Donovan.—One, June 24th, hills to the west of Villa Real.

PLUTELLIDÆ.

Plutella cruciferarum, Zeller.—This ubiquitous insect is of course represented; one, May 5th, along the track from Casevel to Almodovar.

Cerostoma persicella, S. V.—One, June 8th, at Cea, in a wood.

GELECHIDÆ.

Lecithocera luticornella, Zeller.—One, very fine, May 16th, on the hill S.E. of Silves, amongst dwarf-oak in the evening; several were seen.

Depressaria —?—A single specimen, May 14th, between São Bartholomeu do Messines and Silves; it is not fine enough to determine.

Gelechia vilella, Zeller.—One, May 11th, by the stream at Almodovar.

G. spurcella, H.-S.—One, rather wasted, June 12th, at Ponte de Morcellos.

G. malbella, Hüb.—One, somewhat worn, May 16th, on the hill S.E. of Silves.

G. —?—A single specimen, rather worn, May 21st, at an elevation of 2150 feet, at a waterfall at the foot of the last slope of Foia, near Monchique. It seems rather allied to *G. viduella*, but I should not like to describe a new species from a single specimen, which is not in first-rate condition.

Teleia tamariciella, Zell.—One, May 17th, by the streamlet to the west of Silves.

Ptocheuusa inopella, Zell.—One, May 14th, between São Bartholomeu do Messines and Silves.

Parasia castiliella, Mœschler.—One, May 14th, between São Bartholomeu do Messines and Silves, by the road-side in cultivated lands. The specimen is rather greasy, but seems to agree perfectly with Mœschler's description, and it does not accord with any other *Parasia* that I know.

Anacampsis vorticella, Scop.—Five specimens, June 23rd, on the slope above the Corgo, near Villa Real.

Cleodora lineatella, Zell.—One, May 16th, on the hill S.E. of Silves.

Nothris limbipunctella, Staudinger?—A very worn specimen is probably referable to this species. It was taken May 10th by the stream near Aldea do Neves.

Pleurota bicostella, Clerck.—One, June 30th, on the hills above Salamonde.

P. ericella, Dup.—Three specimens, May 6th, at Almodovar; May 10th, near Aldea do Neves; and May 17th, on the hill south of Silves, in dry waste places.

Harpella Staintoniella, Zell.?, aberr. or n. sp.?.—One, in very fine condition, May 20th, in a chestnut wood on the slopes of Picota, at an elevation of 1600 to 1700 feet. This is about the most interesting specimen in the whole batch of Portuguese *Tineina*. The costal spot, instead of being triangular and broadest on the costa, is slender and oblique, its two sides being nearly parallel; the dorsal spot is also smaller than in *Staintoniella* and *Geoffrella*; the connecting silver streak between the two spots, and the absence of the apical black streaks, show this insect to be more nearly related to *Staintoniella* than to *Geoffrella*. It would be hazardous to describe a new species in this genus from a single

I witnessed, and I think I shall show that Réaumur's statement (which always seemed dubious) as to the protection of the eggs by the parent moth must have originated in some mistake.

If my paper seems long, it must be that I have not power to communicate to the reader the intense interest I myself felt whilst watching the proceedings which I have now attempted to record.

About the middle of June, 1876, Mr. Jeffrey sent me larvæ in cases made from *Myosotis cæspitosa* and *Potamogeton natans*; later in the month several from *Hydrocharis morsus-ranæ* and *Sparganium simplex*, this latter plant abounding with cases in one locality; in August came cases from *Catabrosa aquatica*, and in September small larvæ of the next generation in cases from *Potamogeton polygonifolius* and *P. pusillus*. Meanwhile I had been searching in my own neighbourhood, and found a pond with plenty of *Potamogeton natans* in it, and on examining the plants round its margin, detected cases cut from most of those mentioned above, and some also from *Alisma plantago*. It soon appeared, also, that the larvæ sent to me on *Hydrocharis*, a plant not to be obtained here, made no difficulty in taking to any of the others, as well as to *Nymphæa alba*; and, in fine, that whatever might be the food on which the larvæ were found, they were quite as well pleased with that which was most convenient for me to give them; showing themselves, as far as aquatic plants go, thoroughly *polyphagous*.

I now give the details of a case-making, which I watched throughout. The naked larva crawled to near the tip of a leaf of *Potamogeton natans*, fixed its anal legs near the side, and began to eat a little curved channel from the edge through the leaf, working from right to left, its head and body bending round to the left more and more until three-fourths of the intended cut had been accomplished; then, still keeping the same foothold, it ate back again from left to right, clearing out and widening the channel: next it changed its foothold across the channel to the fixed part of the leaf, whence, stretching out its head, it continued eating from right to left, and so carried on the curve of the channel quite up to the edge of the leaf again, leaving only a very narrow isthmus uncut; then, as before, it ate backwards to widen the last cut part of the channel; finally crossing over the channel again, and taking its position on the now almost detached piece, it ate away the last connecting morsel at the very edge, and was adrift as upon a raft: I noticed, however, that a change of plan took place between the first and second parts of its work; the cut made from the first foothold on the side of the leaf had a long oval curve; when, however, *crossing the channel*, the larva continued its work from its foothold on

the leaf, it did not go on from the very end of the cut already made, but began again at a point a little distance further back, thus finally bringing out the channel with a shorter rounder curve, which had the effect of making the detached piece of leaf more symmetrical in outline. It was now afloat, with its ventral and anal legs clinging to its raft, but very soon it applied its thoracic legs to the fixed part of the leaf, and, guiding its course by them, conveyed itself and its raft under the leaf, apparently looking for a suitable place, whence to cut the other half of its case; presently it seemed to find what was wanted, the floating piece was made fast, and after some hours the upper half was cut out and detached, and the larva floated in its finished dwelling. Continuing to watch it, the next thing I noticed was a rapid horizontal motion of the head and front part of the body of the larva, just within the case from one side to the other; then turning about, after a pause, the larva repeated this movement at the other end, rested awhile, and again repeated the movement: next it turned round again and protruded its head from the former end of the case, with the air of taking a survey of the outside, and whilst it was in this position a small silvery air-bubble floated out from inside the case, and when the larva, turning round once more, put out its head from the other end as if surveying that also, the bubble seemed somehow to be attracted and moved over and settled close to its head: after this, the larva set about feeding, and journeying for about an inch, reached the stem of the plant and fed on it for some time, and then moored its case to the stem by a thread and rested: afterwards I saw it eating patches of leaf-cuticle, soon effecting a large hole through the entire substance; next day I saw it again eating, and noticed that from time to time it stopped this occupation, withdrew its head into its case, and made from five to thirteen of these rapid movements from side to side; vigorous and rapid as these movements were, they did not shake the case, and I think were quite independent of it; indeed, I am disposed to regard them as in some way connected with the act of respiration, being analogous to the movements of the larva of *Paraponyx stratiotalis*, described by me at p. 161, vol. xii, of this Magazine. Bearing on this point also will come some observations I made on the presence of *water within the case*; once or twice it happened that a larva had brought its case into such a position that a good portion of it was above the surface of the water, and I was able to look down the opening at the end into the interior, quite through to the other end, and I made sure that it was full of water, and once I could notice a small silvery air-bubble clinging to the side of the case: probably, when the larva fastens up

I witnessed, and I think I shall show that Réaumur's statement (which always seemed dubious) as to the protection of the eggs by the parent moth must have originated in some mistake.

If my paper seems long, it must be that I have not power to communicate to the reader the intense interest I myself felt whilst watching the proceedings which I have now attempted to record.

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its case for pupating, it joins the two pieces so closely together, as to render it watertight, but before that time the openings at the ends are generally so wide that the water cannot be kept out. I am, however, disposed to agree with Réaumur's statement that the larva can control the admission of water to its case, and probably this is regulated by its requirements in the matter of respiration, and must be managed by enlarging or contracting the orifice at either end.

When a larva makes use of *Myosotis*, after selecting the end of a leaf, and detaching a piece of proper length by a semicircular cut, it floats off upon it towards the end of another leaf; there it either mounts on the upper surface, and turns over the piece it is carrying so as to form its new roof, or else carries it underneath and fastens it there as its new floor; either way, after fastening the edges of the detached piece in place, the larva seems to be at leisure in cutting out what is needed from the leaf to complete its case, eating away the surroundings, and not merely making a cut; the cavity between the roof and the floor seems formed by having one of them broader in the first instance than the other, so that when the edges are joined, there is necessarily a bulging out of the broader piece.

When *Sparganium* is the material, the case is of a narrower and more elongated form, the floor being the flatter side, and thus shorter than the roof, which is arranged so that the keeled surface of the leaf is outside, and the thin side-edges drawn inwards, and thus made to help in the formation of the cavity. Not unfrequently the case is formed of two sorts of leaf, for a larva is not particular to have its case all of the same material; apparently in its growth between two moults it changes only one-half of its case at a time, whereas after a moult it sometimes makes a new case entirely; when, therefore, it wants only a new roof or a new floor, it takes it from a suitable plant nearest at hand, cutting the new piece a little larger than its predecessor, and in this way, by changing the top and bottom alternately, it soon brings a small case up to a good size.

On June 11th, I noticed a larva looking as if about to moult, and isolated it for observation: the moult took place on 13th; after the skin burst at the neck, the old head-cover first fell off, and then the (almost colourless) larva began slowly to advance into the water out of its case until nearly exposed, then it stopped still for about ten minutes, when suddenly the hinder segments were set free with an effort that sent the case adrift, while the larva remained quite naked in the water: I secured the abandoned case, and opening it found the cast flaccid skin—not shrivelled up—but held out at full length by *silk threads* along the ventral region.

This larva now proceeded to make itself a case of *Alisma plantago*, first securing a piece of leaf that was near, and then fastening this under another leaf that floated by; three hours after it thus hid itself I turned the leaf over, and found the piece by this time fashioned into a suitable oval shape, and attached to the oval edge of the leaf, so that on that side there was no need of cutting: next day the larva was shaping the second piece—not merely by cutting a channel, but by eating away a large irregular hole outside its case, still, however, leaving a narrow isthmus uncut, so as to keep itself securely moored for a day or two longer; but at last when it had to stretch out further and further to continue feeding on the leaf it made its case tight, cut the mooring, and floated off. When the larva is about to pupate it attaches its case at the edge of one side beneath some floating leaf or submerged stem, often (as Mr. Jeffrey found a great number) to the decumbent stems and tough fibrous roots of the *Myosotis* bared by the action of water, but always fixed edgewise; indeed, the only exception was in a case fixed flat against a piece of *Sparganium*.

After the larva had spun up, from seventeen to twenty days elapsed before the appearance of the imago; I bred seventeen specimens in all at intervals from June 21st to August 26th.

Fortunately for our knowledge of the interesting early part of the economy of *nymphæalis*, Mr. Jeffrey detected amongst some *Potamogeton natans*, gathered promiscuously as food for his larvæ, a large leaf, having eggs deposited on the under-surface, *but without the least covering*; and cutting off the extreme tip of the leaf on which were six eggs, for himself, most kindly sent me, on 8th of August, the rest of the leaf bearing about a hundred eggs of a pale ochreous-greenish colour, close together in a flattish mass near the margin from which the tip had been severed; three days later, by aid of a lens, I could see two black specks on each egg, and in two more days these were distinct enough, and the day after that, August 14th, the larvæ all hatched, and *soon hid themselves by mining into the under-side of the leaf*, not, however, before I had observed and noted their black heads and collar plates with pale greenish-yellow translucent bodies. On the same day Mr. Jeffrey was watching the six eggs he had retained, having placed the severed bit of leaf on the upper surface of a fresh gathered leaf put in water; and at about 8 a.m., saw the little creatures leave the egg-shells, and crawl over the upper surface of the fresh leaf, and from thence to the under surface, which they at once entered by mining on either side of the midrib near the base. In this manner my young brood remained ensconced from thirty hours to three days,

and began to re-appear at first singly, then several together, and then each cut out for itself a tiny film from the under cuticle of the leaf, and floated away on it just as I have described above, and by the 18th of the month the water was crowded with tiny cases not one-eighth of an inch long. After moulting the black colour of the head of the larva became brownish ochreous, the collar-plate still black, the body dirty whitish with broad greenish dorsal vessel, and by help of a strong lens I could see the fine opaque whitish tracheal thread; the larvæ continued to thrive and were frequently making fresh cases, half at a time, until the period arrived for hibernation, when the cases were spun up flat against the leaves, and, content with what I learnt, I sent them adrift to take their chance in a state of freedom.

Emsworth: *March 3rd*, 1881.

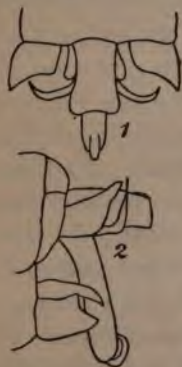
DESCRIPTION OF A NEW SPECIES OF *TRICHOPTERA* (*POLYCENTROPUS KINGI*) FROM SCOTLAND.

BY R. McLACHLAN, F.R.S., &c.

POLYCENTROPUS KINGI, *n. sp.*

In size and general appearance much resembling *P. flavo-maculatus* and *multiguttatus*, especially the latter. The dark portions of the anterior-wings more pronounced, and nearly black, more decided in the spots and spaces on the costal margin: apical fork No. 3 sessile, or with a more or less long footstalk.

In the ♂ the dorsal plate is oblong, with nearly parallel sides. Superior appendages testaceous, with pale hairs, rather short, the apical margin scarcely excised. Intermediate appendages testaceous, divergent, flattened, considerably dilated at the base, but gradually attenuate to the acute apex, inserted near the base of the dorsal plate beneath. Inferior appendages moderately large, sub-oblong, convex externally, the apical margin oblique and somewhat excised; sub-testaceous, with pale hairs, but the margins are fuscous or blackish. Inserted above each of these latter appendages, and lying partially in their concave upper (or inner) portion, is a *yellow flattened supplementary appendage*, fringed with very long pale hairs; viewed laterally, they appear almost linear, because in that position only the edge is seen. Penis *very long and stout*, yellow, directed downward between the inferior appendages, sub-cylindrical, obtuse; at its apex is an appearance as of a short recurved process, which is only occasionally visible. The ♀ presents no decided differential characters in the dry insect.



Expanse, ♂, $14\frac{1}{2}$ — $16\frac{1}{2}$ mm., ♀, 17—18 mm.

Strathglass, Inverness-shire, August, *J. J. King*, about twenty examples.

Like most other species of the genus, this is practically separable

only by the anal parts of the ♂, which are distinct from those of the other described forms. The supplementary inferior appendages, and the very long and strong penis, are especially remarkable, in which points of structure there is some analogy with the genus *Plectrocnemia*, but the insect is a true *Polycentropus* in the restricted sense. See my "Revision and Synopsis," p. 397.

Desiccation alters the forms of the anal parts very considerably, and it is only occasionally that the structure can be clearly demonstrated in dry examples.

Fig. 1 represents the anal parts of the ♂, from above; fig. 2, the same, from side.

Mr. King's captures induced me to make an examination of a series of specimens of *Polycentropus*, taken by Mr. Eaton in Portugal, in 1880. I found that these consist, probably, entirely of undescribed forms, and amongst them are four examples that, in all probability, are specifically identical with *P. Kingi*. One of these, from Alferce, 22nd May, appears to agree in all respects; three others from Monchique, 19th May, Cea, 11th June, and Villa Real, 23rd June, respectively, are much larger (Expanse, ♂, 18—20 mm.), and more strongly marked, but the structure appears to agree. Scotland and Portugal are widely-separated localities, but, considering the great similarity of the species, and the neglect from which they suffer, there is all possibility that this particular species occurs in the intervening districts.

Lewisham, London: 5th March, 1881.

A NEW SPECIES OF *HELOTIDÆ* FROM JAPAN.

BY GEORGE LEWIS.

In the Trans. Ent. Soc., 1874, p. 447, my friend, the Rev. H. S. Gorham, has described a species of *Helota* from this country, and last summer I found a second, a small mountain species, quite distinct from any of the three or four now in the catalogues. I propose to call it—

HELOTA CEREO-PUNCTATA.

Coppery-bronze, shining, head and thorax closely and somewhat coarsely punctured, the latter having a smoother irregular portion before the scutellum, extending half-way up from the base. The thorax is parallel, hinder angles acute, with the centre portion of the base less sharp than in *gemmata*. The elytra are evenly and regularly punctate-striate, the striæ, ten in number, with interstices very slightly convex. The usual wax-like spot before the middle of the elytra is round, and occupies the interstices of the 4th, 5th, and 6th striæ from the suture, the punctures of the 5th being visible down its centre. The second spot is situated before the apex, where the 4th and 5th striæ terminate and join, and it is more oblong than the 1st. Antennæ pitchy-bronze. All the thighs are red for the basal half of their length; and the abdomen is pitchy-red.

Length, 4 lines.

The chief points of difference between this species and *gemmata** are, its smaller size, the entire absence of the raised polished surfaces on the thorax, the evenness and the uniformity of the stræ, and the comparatively larger size of the wax-like spots. The appearance of the first or basal spot in *gemmata*, which rests in the interstice of the fourth and fifth elytral stræ, is as though the spot had pushed aside the punctures which had then opened and formed a "setting" to it. In the present species, the spot covers two interstices; and the 5th stria, running through it, is distinctly visible. The sexual characters of both insects are alike. When *H. cereo-punctata* is alive, it is exceedingly like a *Buprestis*, and this similitude is enhanced by a portion of the red colour of the thighs protruding over the edges of the body, giving the insect the appearance, when viewed from above, of having six red spots on its margin. I have a black species of *Melandrya* with legs (yellow) coloured in the same manner, and as it walks over dead branches it looks like a spotted *Chalcophora*.

I obtained the *Helota* in June, off dead branches of young oaks, which had been killed early in the spring by a forest-fire.

Grand Hotel, Yokohama:
13th January, 1881.

Asopia Lienigialis, Zell., a moth new to Britain.—I captured a *Pyralis* at light in August, 1879, which I put aside as a variety of *P. farinalis*, but in the last August and September I took three others, all at light. I then saw that it was something new and sent a specimen to Mr. C. G. Barrett, who informed me that it was *Asopia Lienigialis*, Zell., a species as yet only recorded as occurring in Livonia and Finland. Another collector here (Mr. Bryan) has also taken three or four specimens.—W. THOMPSON, 183, Stantonbury, Stoney Stratford, Bucks: February 26th, 1881.

[A type of *Asopia Lienigialis* from Professor Zeller differs from *farinalis* in the position of the first whitish line, which is nearer the middle of the wing, the basal blotch being therefore larger and the median area smaller than in that species. The second pale line is more regularly curved and originates in a broader pale streak or blotch on the costal margin. In the hind-wings the first delicate pale striga, which in *farinalis* forms a continuation of the first line on the fore-wings, is, in *Lienigialis*, placed more perpendicularly so that it originates opposite the middle of the basal blotch of the fore-wings. Zeller's specimen closely resembles *farinalis* in colour, but Mr. Thompson's specimens are more fuscous—approaching the colour of *Pyralis glaucinalis*—the markings, however, agree accurately.—C. G. B.]

[The occurrence with us of this Northern species, so closely allied to our old friend *P. farinalis*, is of extreme interest. Baron v. Noleken in his Fauna of Esthonia, Livonia, and Courland, mentions that he had only met with a single

* I found this species commonly in Yezo last summer—on willows, where the larvæ of *Hepia-jus* were at work—so it probably occurs throughout Dai Nippon.—G. L.

specimen. And von Heinemann, in his "Schmetterlinge Deutschlands und der Schweiz," mentions the species not as having occurred, but as *likely to occur* in the North-eastern districts of Germany. Professor Zeller was, at one time, much exercised in his spirit as to whether this might not prove to be the veritable *farinalis* of Linné, but I believe he settled down ultimately in the old established faith, and our nomenclature of the two species has thus not been rudely disturbed.—H. T. S.]

Notes on Lepidoptera taken in Roxburghshire in 1880.—I have made a few notes of some species of moths which I have taken during last season in this district of Roxburghshire, and which may be of some interest, as a few of them, I think, are not generally understood to occur so far north. Any of the species noted of which I had any doubt as to identity, have been confirmed by Mr. C. G. Barrett, and so may be relied upon.

Of the *Sphingidæ*, I obtained one specimen only of *Acherontia Atropos*, found at rest in June. Of *Sesiidæ*, I took two fine specimens of *Sesia bembeciformis*, which emerged from some old sallow bushes, which had been cut in March and laid up for firewood, the moths emerging in the beginning of July. Of the *Hepialidæ*, *H. sylvinus* and *velleda* are both very common; the former swarms on a steep hill-side with patches of bracken and open places, in July, and higher up the hill, where the ground in places is a little marshy, *velleda* may be seen starting about at dusk very commonly. Of *Chelonidæ*, I found *C. plantaginis* at one particular locality very plentiful; the moths were flying over patches of bare heather and marshy ground or moorland, near to an extensive wood of Scotch and spruce fir. When I first discovered them I took over a dozen specimens, all of them ♂, and I did not succeed in taking a ♀ specimen; the moths seemed to fly best about 4 p.m. I found two cocoons of *Arctia fuliginosa* spun up on heath in May, and both produced fine specimens in June. Of *Geometræ*, I took several ♂ specimens of *Hybernica auran-tiaria* in autumn. *Cheimatobia boreata* is common, and I have usually found it settled on hawthorn twigs, more commonly when bordering plantations of fir. *Oporabia filigrammaria* was also very common last autumn, and showing considerable variety in the specimens, both as to size and shades of colouring; I saw them frequently on the sugared trees, and flying at dusk, and often started them during the daytime when passing among the trees in small plantations, principally of Scotch fir. I got one specimen of *autumnaria* at dusk, when sugaring trees on a rather high moorland locality; it differs from *filigrammaria* by all the wings being more elongate in form, and there is a distinct discoidal spot on hind-wings, it also occurred about a month earlier. I found *Larentia salicata* moderately common, sitting on trunks of Scotch fir in an extensive plantation of old trees; here, also, *casiata* was very abundant, and *Cidaria populata* pretty common. I took a few specimens of *Eupithecia indigata* mostly along the borders of fir woods, and *pygmeata* flying during the day. *Melanippe tristata* is common in one locality in what may be termed hilly heath-ground; I found it in the glades of a rather extensive fir plantation running along a moorland ridge, flying among the flowers in the sunshine and again at dusk. *Anticlea derivata* occurs sparingly; I took one specimen at rest on an elm trunk, and two more near a hedge of beech at dusk. *Cidaria prittacata* and *miata* are both tolerably common in autumn, and the latter after hibernation; *suffumata* occurs plentifully in the fir woods, but the var. *piceata* is scarce. *Chesius*

spartiata is common about broom in September. *Tanagra chærophyllata* is rather scarce, but occurs very plentifully on the grassy hills about fifteen miles to westward. Of *Noctua*, I took in September two fine specimens of *Calamia lutosæ* at sugar. *Celæna Haworthi* is rather common on the high moorland ground, and obtained best by sugaring the scattered trees of Scotch fir growing there. *Noctua glarea* is sufficiently common for one to obtain a good series without difficulty. *Orthosia lota* and *macilenta* are not scarce, and I took a number of each in fine condition; also two specimens of *Hecatera serena*. *Poli chi* is very common, and the variety *olivacea* frequently occurs, some of a pale green, varying to a dark smoky shade, the abdomen being almost black. I took about a dozen specimens of *Aplecta occulta* at sugar, a few of them on the Scotch firs in the moorland locality, where *Celæna Haworthi* occurs. At the same place, *Hadena adusta* swarms at sugar in June; and in a leaf-wood bank near to this, and also on hedgerow trees, *thalassina* and *contigua* are pretty common. Of the *Calocampæ*, I took ten fine specimens of *exoleta* and three of *vetusta*: one of the former on the high moorland ground. *Habrostola urtica* was common at raspberry bushes in June, I think, of 1879, but much scarcer last season. *Plusia pulchrina* and *iota* are both moderately common, the former mostly at honeysuckle, and *iota* at bloom of rhododendron. Of the species which seem scarce, and of which I have taken of each only a single specimen, I may mention the following: *Acronycta ligustri*, *Noctua conflua*, *Orthosia suspecta*, *Tethea subtusa*, and *Epunda viminalis*.—A. ELLIOT, Samiaston, Jedburgh, N.B.: February, 1881.

Early appearance of Pieris rapæ.—This afternoon, at Merton, Surrey, I was surprised to see one of the small white butterflies, *P. rapæ*, flying about in the bright sunshine, apparently enjoying it. I have never before met with this species so early in the season, and it struck me as so unusual that I stayed for some minutes watching it.—JOHN W. DOWNING, 59, Lupus Street, S.W.: March 15th, 1881.

Ichneumonidæ new to Britain.—A few Ichneumons taken here by me were forwarded to Mr. Fitch, by Mr. E. A. Butler, who has kindly examined them and informs me that there are among them two species new to Britain: *Agrothereutes batavus*, Voll., Tijds. v. Ent., xvi, p. 209, pl. ix, fig. 1, ♀, among the *Cryptides*, and *Lissonota leucozona*, Grav., Ichn. Eur., iii, p. 100, ♀, one of the *Pimplides*. These were taken in the same sand-pit in which I found *Bothynotus pilosus* and about the same time, in September. I also found *Aptesis stenoptera*, Marshall, Ent. Mo. Mag., v, p. 156.—E. N. BLOOMFIELD, Guestling Rectory: March 4th, 1881.

Dr. Adler's second memoir on dimorphism in the Cynipidæ which produce Oak-Galls.—In Vol. xiv, p. 44, of this Magazine, attention was briefly directed to a remarkable assertion by Dr. Adler, of Schleswig, to the effect that certain of our oak-galls, and their producers, are only dimorphic conditions, the galls in one brood being totally different in form from those of the other, and the flies so different as to have been placed in distinct genera: Dr. Adler's statement and the proofs, were fully detailed in the "Deutsche entomologische Zeitschrift," 1877, pp. 209—248. At that time his statements were received with a considerable amount of incredulity: but subsequently some, at least, of his observations were proved to have been correct, by Messrs. J. E. Fletcher, Lichtenstein, and Cameron (cf. Ent. Mo. Mag., xiv, p.

265; xv, p. 12). Dr. Adler has just published a very extended memoir on the same subject in the "Zeitschrift für wissenschaftliche Zoologie," Bd. 53, pp. 151—246 (February, 1881), in which he gives the results of his experiences concerning a very large number of oak-gall *Cynipidæ*, and illustrates his memoir by two very excellent folded chromo-lithographic plates with figures of the galls, in which the latter are delineated with a truth to nature rarely equalled. It is not pretended in this short notice to fully detail the results obtained by Dr. Adler, and the *modus operandi*.

The results amount briefly to these:—

PARTHENOGENETIC BROOD.

SEXUAL BROOD.

<i>Neuroterus lenticularis</i>	is changed to	<i>Spathegaster baccarum</i> .
" <i>lævisculus</i>	"	" <i>albipes</i> .
" <i>numismatis</i>	"	" <i>vesicatrix</i> .
" <i>fumipennis</i>	"	" <i>tricolor</i> .
<i>Aphilotrix radialis</i>	"	<i>Andricus noduli</i> .
" <i>Sieboldi</i>	"	" <i>testaceipes</i> .
" <i>corticis</i>	"	" <i>gemmatus</i> .
" <i>globuli</i>	"	" <i>inflator</i> .
" <i>collaris</i>	"	" <i>curvator</i> .
" <i>fecundatrix</i>	"	" <i>pilosus</i> .
" <i>callidoma</i>	"	" <i>cirratus</i> .
" <i>Malpighii</i>	"	" <i>nudus</i> .
" <i>autumnalis</i>	"	" <i>ramuli</i> .
<i>Dryophanta scutellaris</i>	"	<i>Spathegaster Taschenbergi</i> .
" <i>longiventris</i>	"	" <i>similis</i> .
" <i>divisa</i>	"	" <i>verrucosus</i> .
<i>Biorhiza aptera</i>	"	<i>Teras terminalis</i> .
" <i>renum</i>	"	<i>Trigonaspis crustalis</i> .
<i>Neuroterus ostreus</i>	"	<i>Spathegaster aprilius</i> ?

In the following only one brood, and that parthenogenetic, and not dimorphic, was obtained, viz.: *Aphilotrix semilunatus*, *A. marginalis*, *A. quadrilineatus*, and *A. albopunctatus*.

There are sufficient materials in the list above given to excite the astonishment of entomologists, and to induce them to follow up the author's observations, not only on the species named, but also on other gall-flies.

Perhaps one of the most remarkable couplings is that of *Biorhiza aptera* (the root-gall of the oak) and *Teras terminalis* (the common oak-apple); the insect of the former is always apterous, and must occasionally climb 50 or 60 feet in order to deposit its eggs in the twigs on which the "oak-apples" are produced.

The forms are divided into the *Neuroterus*-group, the *Aphilotrix*-group, the *Dryophanta*-group, and the *Biorhiza*-group.

The memoir concludes with an examination of the anatomical structure of the ovipositor in *Cynipidæ* and of the manner in which the eggs are laid.

All Entomologists interested in this question should study this memoir: the plates will enable them to identify most (if not all) of the British oak-galls, and will perhaps lead to the discovery of others.—R. McLACHLAN, *Lewisham*: 14th March, 1881.

Sehirus 2-guttatus and other Hemiptera near Hastings.—On Saturday last, my brother and self took from moss, growing in a good-sized wood at Guestling, a nice series of the above. Believing it to be uncommon, I thought it was worth while

recording. I took at Fairlight last July, a developed specimen of *Pithanus Märkeli*, and a developed specimen of *Acalypta parvula*, at Rye Harbour.—E. P. COLLETT, 12, Springfield Road, St. Leonards-on-Sea: *March 15th*, 1881.

Acalypta cervina near *Hastings*.—A few weeks ago, I found a specimen of this bug in moss in Hollington Wood. There were a number of larvæ with it, which, from their appearance I should judge to be of the same species.—E. A. BUTLER, *Hastings: March 16th*, 1881.

Hibernating Hemiptera in Perthshire.—The winter here has been very severe, snow has been continuously on the ground for 11 weeks, and the temperature was on several occasions below zero, Fahr.; lately, however, I have brought in daily, leaf and moss *débris*, but found nothing in the way of bugs except one specimen of *Gnathodus punctatus*, a curious time to find it.—G. NORMAN, Athole House, Pitlochry: *March 3rd*, 1881.

Sericomyia borealis near *Hastings*.—I was much surprised to see here the last two seasons the very beautiful fly *Sericomyia borealis*, Fall. It has appeared very sparingly at Guestling, but when at Dallington Forest, September 1st, 1880, we saw it not uncommonly. I thought it an exclusively northern species. It has not, I think, been previously noticed as occurring in Sussex by any of our naturalists, such as Mr. Verrall, Mr. W. C. Unwin, and Mr. J. H. A. Jenner, all of whom have paid some attention to our *Diptera*.—E. N. BLOOMFIELD, Guestling Rectory: *March 4th*, 1881.

Sapromyza bipunctata, a *Dipteron* new to Britain.—Among some flies sent to Mr. Verrall in 1879, one species, *Sapromyza bipunctata*, Meigen, seems to be new to Britain. I do not know at what time of the year I took it.—ID.

Lathridius flum, Aubé, at Burton-on Trent.—Mr. Mason brought me over to Repton, at the beginning of last month, some beetles which he had found in his Herbarium, which, on examination, I found to be *Lathridius flum*, of Aubé. Mr. Mason compared them with some specimens in Mr. Rye's cabinet, with which they perfectly agreed. This insect was taken in Edinburgh, by Mr. McNab, of the Royal Botanic Gardens, and recorded in this Magazine, vol. iii, p. 46.—WILLIAM GARNEYS, Repton: *March 17th*, 1881.

ENTOMOLOGICAL SOCIETY OF LONDON: *2nd February*, 1881.—H. T. STANTON, Esq., F.R.S., President, in the Chair.

The President appointed Sir J. Lubbock, Bart., and Messrs. Meldola and Distant, Vice-Presidents for the year.

The following were elected Members, viz.:—Alfred Lloyd, Esq., of The Dome House, Upper Bognor, and Theodore Wood, Esq., of 5, Selwyn Terrace, Upper Norwood.

Mr. Salvin exhibited a large collection of insects of all Orders from Guatemala, recently received from Mr. Champion.

Mr. W. A. Forbes exhibited (on behalf of Dr. Sclater), a singular species of *Coccidæ* from New Britain, covered with long white filaments. Also a large larva of one of the *Blattidæ*, found by himself at Pernambuco, having a deceptive resemblance to an Isopod Crustacean.

Mr. McLachlan exhibited large Coleopterous larvæ from South America, apparently belonging to the *Dynastidæ*, whence proceeded remarkably fine examples of the fructification of a *Cordyceps*. He remarked that it was no doubt the same species as that described and figured by G. R. Gray in a privately-printed work on insects attacked by fungi, issued in 1858, in which several similar instances are noticed. He also exhibited a *Noctua* from South Wales, sent by Mr. Barrett, attacked by a fungus of the genus *Isaria* (since identified by Dr. M. C. Cooke with *I. sphingum*, Sch.).

Mr. Pascoe exhibited an example of *Peripatus novæ-zelandiæ*, remarking on the difference of opinion that has existed, and still exists, with regard to the affinities of these singular animals, which were originally classed with the Vermes, afterwards apparently proved to be Arthropods, but now again transferred to their former position by some authors.

Mr. Billups exhibited *Pezomachus distinctus* from Mickleham, a species new to Britain, and a *Stibentes* from Deal, also new to this country.

Mr. Distant exhibited a very fine new species of *Cicadidæ* of the genus *Platyleura*, from Madagascar.

Mr. Meldola read a letter from M. André, replying to certain criticisms at a recent meeting (*vide antea*, p. 167) as to the practice of printing short descriptions of new species on the cover of a work, for the sake of securing priority.

Mr. Fitch read an extract from an Australian newspaper regarding the death of a child from the supposed bite of a small spider.

Mr. Butler communicated "Descriptions of new genera and species of Heterocerous *Lepidoptera* from Japan."

Mr. McLachlan read "Notes on *Odonata* of the sub-families *Corduliina*, *Calopterygina*, and *Agrionina*, collected by Mr. C. Buckley, in the district of the Rio Bobonaza in Ecuador." One beautiful new species—*Thore concinna*, McLach.—was exhibited.

Mr. Kirby read a "List of the *Hymenoptera* of New Zealand," enumerating 82 species, five of which were new. No *Apidæ* had been discovered.

Mr. Baly read "Descriptions of new species of *Galerucidæ*."

2nd March, 1881—The President in the Chair

H. Bedford Pim, Esq., of Leaside, Upper Norwood, was elected Member of the Society.

Mr. Fitch exhibited an example of *Strangalia 4-fasciata*, taken by Mr. Olliff at West Wickham, in August last.

Mr. W. C. Boyd exhibited a remarkably fine example of *Calamia lutosæ*, which he had found at a gas-lamp at the Liverpool Street Terminus of the Great Eastern Railway, to which it had possibly been brought by one of the trains. Also what was supposed to be a curious variety of *Ennomos tiliaria* taken at Cheshunt.

Mr. Kirby shewed parts of a general work on entomology in course of publication by Herr Buchecker, of Munich, in which coloured photographic figures formed prominent features. Mr. McLachlan said that the portion of this work relating to dragon-flies had been very severely criticised, especially as regards the ignorance shown in the text.

Mr. Fitch read a detailed report from the "Western Daily Mercury" on the discovery of living Colorado-beetles in possession of a man near Plymouth, with editorial leaders on the legal proceedings taken against that individual.

Mr. McLachlan called attention to a remarkable memoir by Dr. Adler on dimorphism in oak-gall *Cynipidæ* (see *ante*, p. 258).

Mr. Pascoe read a paper on the Rhyncophorous genus *Hilipus*, of Germar, and its neotropical allies, and exhibited a long series of species in connection therewith.

Mr. Distant read "Descriptions of two genera and species of *Rhynchota* from Madagascar."

Professor Westwood communicated notes on *Scleroderma* and allies.

NOTES ON BRITISH TORTRICES.

BY C. G. BARRETT.

(Continued from page 84).

Peronea (Teras) Logiana, Schiff., = *tristana*, Hüb.—I met with the larva of this species for the first time in great abundance in Somersetshire, eighteen months ago. Wilkinson's description of its habits is very good. When feeding on the bushes of *Viburnum lantana* in the hedges, the discoloration produced among the leaves was surprising, indeed, those on the lower portions of the bushes down the side of the bank became a tangled mass of drawn-together and dead-leaf membrane, only the under-side of each leaf being eaten away. The larvæ were active, slender, slightly flattened, with deeply divided segments—more so than usual in this genus,—very pale yellowish, with large, distinct, dull green or brown, internal dorsal vessel. Head very pale yellowish, mouth darker, plates and feet almost colourless. Young larvæ remarkably colourless, except the dorsal vessel. On *Viburnum lantana*, eating the under surface and parenchyma of the leaf, and drawing the space between the ribs longitudinally together (much as is done on a smaller scale by the larva of *Lithocolletis lantanella*), living in a small chamber more closely drawn together at one end of this space. Feeding through September, spinning up among the leaves. Pupa brown. The moths emerged in considerable variety in October and November.

These Somerset larvæ differed in colour from those described by Wilkinson, and by Kaltenbach, being yellowish rather than olive-green. The latter author notices the curious habit of the species of scraping off the down ("felt") of the under-side of the leaf (a habit in which it resembles some of the larvæ of the *Pterophoridae*), he also states that the pupa has two oblique rows of short tufts of bristles on each hinder abdominal segment.

Peronea rufana, Schiff.—The year before last, my friend, Mr. Dunsmore, of Paisley, when on an excursion to the west of Scotland, found larvæ of this species in abundance, and reared the moths. Before the season came round he went to America, but left his friends, Messrs. Watson and Whyte, of Paisley, full information respecting his locality, and to their united kindness I am indebted for the opportunity of rearing and describing this larva. It is so unlike the usual style of *Peronea* larvæ, that I felt certain, until the moths actually emerged, that my kind correspondents had collected another larva (perhaps *Penthina dimidiana*) by mistake; therefore, the emergence of the promised species was an agreeable surprise. The larva is not very active, cylindrical, plump when full grown, smoky-grey of various shades, sometimes blackish, especially on the back, but fading to smoky-green when full-grown; spots raised and distinct, shining, and with short hairs. Head black, or blackish-brown, or occasionally brown, dorsal plate shining jet-black, anal plate yellowish-green, anterior feet black. In July and August, on *Myrica gale*, drawing neatly together the terminal leaves, and eating out the heart of the shoot. Pupa dark brown, spun up among dead leaves and rubbish. The moths emerged through September. One of them is the red variety with the slaty tinge, which so much resembles *lipsiana*, but its fore-wings are more pointed than in that species.

Peronea hastiana, L.—Larva when young, very pale yellow-green, or bluish-green, head and plates black or blackish, or sometimes anal plate green; under the turned-down edge of a leaf of willow. When rather older, the dorsal plate is dark brown, and sometimes the dividing line is visible on it. When half-grown, pale green at the sides, dusky-green on the back, sometimes with a faint whitish efflorescence or downy appearance, head light brown, plates green or anal plate yellow; still under turned-down leaves, or beginning to unite leaves flatly together, and feeding between them. When full-grown, entirely pale green, generally with the whitish efflorescence, which is especially visible between the segments, but the head and dorsal plate often have a brownish tinge. Full-grown larvæ of the first brood, however, have sometimes black head and plates. This brood which is not common, is full-fed by the end of May. The second brood is plentiful enough, feeding between the leaves of the common species of willow at the road sides, from July to September, folding the leaves or drawing together two or more, or joining a leaf to the twig, sometimes disfiguring the bushes, always leaving the feeding place when full-fed to spin up among rubbish on the ground. Pupa dark brown, in a slight cocoon. Moths

emerging through September, October, and November. According to my experience, the larvæ collected in July and early in August the moths from which emerge in September, produce a far larger proportion of singular and beautiful varieties of the perfect insect than those collected later. The moths from the May brood are small, and still less variable. Treitschke says that the larva feeds on *Salix caprea*, *aurita* and *acuminata*, *Andromeda* and *Vaccinium*. It seems probable that the larvæ on the two last-named plants may belong to other species, possibly *maccana*.

Peronea variegana, Schiff.—Larva rather sluggish, cylindrical, but slightly flattened anteriorly, with deeply divided segments. Pale yellowish or pale green, with distinctly pulsating dark green or reddish-brown internal dorsal vessel. Spots not visible, hairs minute, head shining yellowish-brown, plates yellowish or green. On hawthorn, joining two leaves together with very white silk, often joining a dead leaf to a living one. It, however, deserts this habitation to spin up. Feeds through July, and the moth emerges in August or September. It also feeds on blackthorn and other trees. Treitschke says on fruit trees, *Corylus*, *Cotoneaster* and *Carpinus*, Wilkinson rose and bramble.

I am well aware of the extreme difficulty of establishing a new species in such a genus as *Peronea*, but I find that the *species* of the genus are *exceedingly constant* in one respect, that of the *form of their fore-wings*. Therefore, I have for years been puzzled by specimens which did not agree in this respect with any recognised species. My first specimens were taken in a "car" at Ranworth fen, and I placed them provisionally with *logiana*, but, after rearing that species in large numbers, and becoming intimately acquainted with its shape and its phases of variation, I saw that the Ranworth specimens must be removed. They were then placed with *Schalleriana*, but when I found the species in some numbers here in Pembrokeshire, and collected it along with *Schalleriana*, *comparana*, and the varieties of *variegana*, and saw its distinct shape—even more evident in living specimens,—I had no resource but to look upon it as a species distinct from all of them; and, further, that the separation of this form rendered the allied species much more natural and recognisable. I find that my own difficulty has been shared by several friends—close and careful students of this group,—and they cordially agree in my view of the distinctness of the species. Dark specimens sent to Professor Zeller, several years ago, *were not known* to him.

As I cannot find among the numerous old descriptions of (so-called) species of *Peronea*—since deservedly reduced to the ranks of varieties,—any that can be relied upon as referring to this species, I am compelled to find it a name, and, therefore, adopt one which it has thoroughly earned.

Peronea perplexana, sp. n.

Fore-wings long, with costa much arched at the base, apex slightly pointed, and anal angle full and rounded, so as to give the wing a rather truncate form. Glossy, pale chestnut, varying to greyish-brown, and very dark grey-brown, almost black, appearing rather reticulated from being crossed by five irregular lines of slightly raised brown dots, and having in the middle of the second of these lines a distinct raised "button" of brown scales, which is very apparent in the darker varieties. Margin of basal blotch indicated by the usual brown streak from the base of the dorsal margin of the wing. Costal triangular blotch large, red-brown, varying to black-brown, reaching two-thirds across the wing, and nearly to the apex, but often merged into a broad, oblique fascia, which then occupies great part of the posterior half of the wing. The anterior margin of this triangular blotch coincides with the second line of dots and raised button, already mentioned, and is of a rich red-brown in even the darkest specimens. Cilia brown, with a darker interrupted line at the base. Hind-wings faintly tinged with grey, with darker margin, and pale cilia. Head and thorax brown or grey-brown, varying with the fore-wings, abdomen greyish, with a light brown anal tuft.

It differs from *Schalleriana* in the more decided basal arch of the costa, from that species and *comparana* in its longer wings and more truncate hind margin, and from *logiana* in its more pointed apex and longer wings. It is altogether a broader-winged insect, and larger than *comariana*. In colour it resembles some varieties of *comariana* and *comparana*, and in its produced blotch, the variety *latifasciana* of *Schalleriana*, but its triangular blotch is not so flat as in these species, and is never margined with white as in the last-named. Its larva is rather slender, cylindrical, not active. When young, yellowish-white, with a reddish or greenish internal dorsal vessel, head and dorsal plate black; when older, greenish-white with green dorsal vessel, head and dorsal plate pale brown. On hawthorn (*Crataegus oxyacantha*) and blackthorn (*Prunus spinosa*), folding down the edge of a leaf lengthwise, or drawing it together, feeding in the middle of June. Pupa light brown. I think that the larva spins up in its leafy habitation—certainly it does so sometimes. The imago appears about the middle of July, and is almost always found in hawthorn bushes, though I have reared it from blackthorn. In this district it frequents warm, sheltered lanes, especially near the sea, but I have seen specimens from Herefordshire, and, I think, from Kent. I do not think that it is a generally distributed or common species.

Peronea aspersana, Hüb.—The larva of this species cannot be looked upon otherwise than as a nuisance—here, at any rate. On the coast it swarms on the sand-hills, feeding impartially upon *Rosa spinosissima* and *Poterium sanguisorba* in the quarries, also on the *Poterium*, and, for purposes of deception, no doubt, on *Potentilla reptans*, the leaflets of which it draws together and gnaws. From the mountains I brought home minute larvæ, on the common *Tormentilla*, and cherished them to full growth, only to be disappointed by the appearance of *aspersana*, and a larva on *Potentilla anserina*, with the curious habit of gnawing into the mid-rib, and causing the upper leaflets to wither, was reared with equal curiosity, and a similar result. It also forms one of the company of species the larva of which delight to feed in the top shoots of *Spiræa ulmaria*, when trying to unfold itself, in the Norfolk marshes. The young larva is slender, cylindrical, active, yellowish or pale yellowish-green, with jet-black head, dorsal plate jet-black or blackish-brown, anal plate grey or yellowish with a dark spot. When older, still slender and active, yellowish-green, or bluish-green with the under-parts yellowish, or dark green, with the head and plates light brown, the latter sometimes black-margined, and, in some of the full-grown larvæ, the plates become shining green. Drawing together the leaflets of the above-mentioned plants and gnawing their surfaces; leaving the shoot when full-grown to spin up among rubbish. Feeding in May and to the middle of June; emerging in July.

Peronea Shepherdana, Steph.—For the larva of this very local species I am indebted to the kindness of my friend, Mr. W. H. B. Fletcher, who sent a good supply from Wicken Fen last June. I am thus enabled to describe the variations of this larva, which varieties I certainly expected would prove to belong to more than one species. The larva is not active, cylindrical, but slightly attenuated at each end. When young, whitish, tinged with grey on the back, and with a yellowish internal dorsal blotch about the ninth segment. Spots and hairs hardly discernible, head light brown with dark brown eyes and jaws, dorsal plate black or dark brown, anal plate faintly brownish, anterior legs black. When full-grown, pea-green, tinged with darker on the back, internal dorsal line visible, pulsating regularly, spots invisible, hairs distinct, head yellowish-brown, jaws brighter brown, plates pea-green, the dorsal plate having the posterior margin, and the anal, the anterior margin, dotted with blackish. Feet greenish. Or dull whitish, or very pale yellowish, with the entire dorsal region dull

grey, spots large, pale yellow, head very light brown, plates dull pale yellowish. Or pale yellow, with the whole dorsal region tinged with olive-green, spots paler and shining, head very pale brown, plates and legs yellowish.

All on *Spiræa ulmaria* spinning together the young (undeveloped) leaves, and living between them, often gnawing the young mid-rib, so as to cause the upper part of the leaf to dry up. Feeding up in the undeveloped tops, but quitting them when full-fed, to spin up among rubbish, or under the turned down edge of a dead leaf. Pupa light brown; moth emerging from the middle to the end of July. I am not aware that it feeds on any other plant. The moths are remarkably constant in colour and markings.

Peronea Lorquiniana, Dup. (*Bactra uliginosana*, Steph.).—The larva also reached me from Wicken Fen, collected there by my friend, Mr. F. D. Wheeler. It is moderately active, rather long, cylindrical, but with deeply divided segments; when young, pale pea-green, with a faintly powdery efflorescence, a darker green internal dorsal vessel, and hardly perceptible sub-dorsal lines; when older, yellowish-green, with the sub-dorsal lines more distinct. Head faintly brownish, without spots or markings; plates both shining green. In blossom spikes of *Lythrum salicaria*, feeding on the flowers in August. These were larvæ of the second brood, which should have produced the moths in the autumn, and some were reared by Mr. Wheeler and others, but mine died when full-grown.

Pembroke: 11th March, 1881.

NOTES ON THE LEPIDOPTERA OF THE VALAIS.

BY R. C. E. JORDAN, M.D.

In the early part of June, 1880, I spent a fortnight in the Visp and Saas Valleys, Mr. Geo. Baker, of Edgbaston, being with me; we both worked diligently at the *Lepidoptera* of the district, and with tolerable success. The following *Rhopalocera* were taken by us in addition to those recorded by me in a previous list as captured in June, 1878 (Ent. Mo. Mag., vol. xvi, p. 86).

Papilio Podalirius, common; at my last visit I only saw one.

Pieris Callidice, common above the tree-limit.

P. napi, *bryoniæ*, and the spotless males were, of course, common, but on the 15th of June, I caught one female *napi* between Zermatt and

St. Nicholas; it was in every way a well marked example of the second brood. *P. rapæ*, several examples were taken on the same day, also identical in appearance with the second brood.

Anthocharis Belia, common; I took one fine female in the Saas Valley, with the apical spot light grey, but the mark on the disc deep black.

Colias Edusa, var. *Helice*, Visp Valley.

Polyommatus Dorilis, var. *subalpina*, Visp Valley.

Lycæna Baton, Visp and Saas Valleys. *L. Icarus*, var. *Icarinus*. *L. Corydon*, Visp Valley. *L. Damon*, near Stalden, Visp Valley. *L. Sebrus*, I cannot quite make up my mind about this insect, the specimens caught, which were of both sexes, resemble *Sebrus* exactly in size, but in colour, and in the width of the black border, the males are very similar to *semiargus*, much more so than in the type examples of *Sebrus* in my cabinet; it may be a small race of *semiargus*: of course, this latter was abundant. *L. Cyllarus*, common in one field in the Saas Valley amongst *Vicia onobrychioides*; that field could not easily be forgotten, it was gay with flowers, *Machaon* and *Podalirius* were abundant, so also were *Apollo*, *Hyale*, *Athalia*, *Phæbe*, *Euphrosyne*, and many other butterflies; every now and then an *Ascalaphus*, with its straight undeviating flight, passed over head, whilst the dark velvet-looking *Erebia Evias* flitted over the grass, or a large black-winged *Bombus* settled on the blossoms. Such was the near scene, but the picture is very incomplete unless we remember that the Monte Rosa range bounds the Valley above, and that downwards we look on the snows of the Bernese Oberland. Amongst the *Lycæna* taken were specimens of *Ægon*, *semiargus*, and *Arion*, all varying on one uniform plan, namely, the posterior half of the wing shaded deeply with black, gradually passing into blue, but the black margin filling quite the half of both upper and lower wings.

Nemeobius Lucina.

Vanessa comma, *Io*, and *Antiopa*, all worn, and evidently hibernated; larvæ of *Io* were also common at the same time on the nettles. *V. urticae* was common, and in fine condition.

Melitæa Cinxia, Visp Valley.

Argynnis Dia.

Erebia Goante, Visp Valley.

Æneis Aëlo was common near Saas-im-Grund, in one stony part of the Valley; some fell to my lot, but my companion, who was fleet of foot than myself, caught several.

Pararge Megæra.

Epinephele Janira, near St. Nicholas, where, this visit, we took no *Lycaon*; it was probably too early for the latter.

Cænonympha Arcania, var. *Darwiniana*, I took a large series of this form, mostly in the Saas Valley; some of these specimens resembled *Arcania* enough to have been found amongst the typical species in a German wood, others, on the contrary, cannot be distinguished from the *Satyron* of the High Alps. There is scarcely a break in the links from *Arcania* to *Satyron*.

A *Syrichthus*, taken in the Saas Valley, seems to me distinct, but it is, perhaps, a variety of *Alveus*.

Nisoniades tages.

Hesperia lineola, *comma*, and *sylvanus*, taken in the Visp Valley.

At Aigle (Canton Vaud) *Argynnis Ino* and *Pararge Ægeria* were caught.

Ino globulariæ, one taken low down in the Visp Valley. The commonest species is *Geryon*, but there are two forms of *Staticea* common, one with fewer scales on the wing and slightly different antennæ.

Zygæna filipendulæ.

Z. transalpina, Visp Valley.

At the Schwarze See the larvæ of *Zygæna exulans* were most abundant; Mr. Baker brought some of these home and reared them successfully.

The following list of *Bombyces* is incomplete, some species being as yet not satisfactorily determined by me, and, therefore, omitted.

Setina aurita, abundant, var. *ramosa*, common, occurring even in the birch region.

Gnophria rubricollis.

Emydia cribrum, var. *candida*.

Nemeophila plantaginis and *russula*.

Callimorpha dominula, Visp Valley.

Spilosoma mendica, Visp Valley.

Dasychira fascelina, Visp Valley.

Leucoma salicis, Visp Valley.

Porthesia similis (*auriflua*).

These last two were reared from larvæ found in the Valley. Mr. Baker reared a remarkable variety of the gold-tail moth, a male, with the ground colour a beautiful sulphur-yellow, instead of white.

Bombyx neustria and *castrensis*, both reared from larvæ. *B. lanestris*, larvæ abundant on birch near St. Nicholas in webs (not reared). *B. quercûs*, larvæ found and reared; perfect insects caught.

Drepana falcataria, between Zermatt and St. Nicholas.

Cymatophora duplaris, Saas Valley.

Diloba cæruleocephala, larvæ abundant on *Prunus mahaleb* (not reared).

In this list of *Bombyces* the unrecorded insects are :

Nola, one or two species ; I am inclined to think all are *centonalis* but there is so much difference in shade, that, perhaps, there may be two kinds.

Setina, probably another species amongst the varieties of *aurita*.

Lithosia complana ?, the yellow is so much duller than in the type, that it may be different.

Gnophria quadra, taken at Sierre (not in either Visp or Saas Valleys).

Ocnogyna parasita, eggs of this moth were found (in the Valais) in our walk from Chamounix to Martigny. They were brought home, and Mr. Baker was successful in rearing the species. The female is especially curious, looking like a *Spilosoma*, with the wings of a female *Diurnea*. Four species of *Psychidæ* complete the list.

I shall not attempt at present to give the names of *Noctuæ* or *Geometræ*.

The few walnut-trees in the Visp Valley were as much disfigured by *Gracilaria juglandella* as my lilac bushes are by *G. syringella* at home. The box containing my *Micro-Lepidoptera* was by accident crushed quite flat, and none escaped.

The plumes not recorded in my former list (Ent. Mo. Mag., vol. xvi, p. 21) were *Leioptilus carphodactylus*, taken low down in the Visp Valley, and *Oxyptilus obscurus*, caught in the hilly field half way up the Riffel.

I hope time and opportunity will allow me to increase this list at some future day.

105, Harborne Road, Edgbaston, Birmingham :

March 11th, 1881.

A NEW SPECIES OF *DEGEERIA*.

BY H. N. RIDLEY.

In March, 1879, I took, under the dead bark of an elm tree, in a field near Cunnor, in Oxfordshire, several specimens of a *Degeeria* which I at first referred to *D. nivalis*, but, on recently examining them, I find them to be very distinct.

DEGEERIA PULCHELLA, *sp. n.*

Head yellow ; eyes black, connected by a black V-shaped band. First thoracic segment yellow, anterior margin black ; second segment black ; third yellow ; the

fourth segment (the first abdominal) black; the fifth yellow; the sixth yellow, margined with black, with an irregular black band running transversely across it, and extending on the under-surface so as to form almost a complete ring round the body; seventh segment black. There is also a lateral black line along the first two segments. The antennæ are twice the length of the head; the first and second joints yellowish, the third and fourth purplish, the articulations of the second and third are black. The legs are white, with black articulations. The spring white.

This insect is undoubtedly near *D. muscorum*, Nic., but is distinguished by the shorter antennæ, the black articulations of the antennæ and limbs, and the greater preponderance of black over the whole body.

The markings in the whole genus *Degeeria* are fundamentally the same, at least, in the yellow species, the great difference being caused by the variability in breadth of the black bands which margin the body-segments; this species has broader black bands than any other with which I am acquainted, which give it the appearance of being regularly banded with alternate black and yellow. The amount of black also varies in this species, apparently according to age; for, in a smaller and presumably younger specimen, the fifth segment is yellow margined with black, while in the adults, the black has extended entirely over the segment, leaving only a trace of the yellow, and in the younger specimen again, the articulations of the feet and the antennæ are rather grey than black. It is certainly the prettiest species that I have as yet seen.

20, Portsea Place, Connaught Square:

April, 1881.

ON PARTHENOGENESIS IN THE *TENTHREDINIDÆ*.

BY P. CAMERON.

My observations last year have enabled me to add two species to the list of parthenogenetic *Tenthredinidæ*; and to prove the occurrence of complete parthenogenesis in *Pæcilosoma pulveratum* and *Eriocampa ovata*.

A virgin ♀ of *Nematus pavidus*, Lep., laid a few eggs from which I obtained two males.

A specimen of *Taxonus glabratus*, Fall. (*agilis*, Kl.), bred from larvæ which fed up at the end of July, laid eight eggs, which were certainly fertile, but the larvæ perished in the eggs, owing to the food-plant drying up.

Five *Pæcilosoma pulveratum* laid in June from five to eleven eggs each, but out of that number only two larvæ became full-fed. On

examining these this week I found one larva dead and mouldy; the other had become an imago, but had died before getting rid of the pupal skin. It is a ♀.

Two *Eriocampa ovata* laid between them about fifty eggs, but most of the larvæ died young. Five, however, spun up, and one ♀ has just emerged in the perfect state. Unfortunately I can get no alder leaves at present to continue the experiment with this female.

Glasgow: 7th April, 1881.

DESCRIPTION OF A NEW GENUS AND TWO SPECIES OF *HEMIPTERA-HETEROPTERA* FROM SOUTH AMERICA.

BY JOHN SCOTT.

The insects which I am about to describe are extremely interesting, on account of their furnishing, so far as I am aware, an additional link to the chain of the various ways by which the members of this group obtain an existence. They were forwarded to me some considerable time ago by my friend the Rev. O. Pickard Cambridge, who in his letter accompanying them, says: "they were found living *en famille* with colonies of spiders."

Family NABIDÆ, Fieb.

Genus *ARACHNOCORIS*.

Head, viewed from above, short, five-sided. *Antenna*: 1st joint shortest, a little more than half the length of the 2nd; 2nd, 3rd and 4th sub-equal, the latter somewhat fusiform. *Eyes*, viewed from above, almost semi-globose. *Ocelli* small, inserted near the base of the head. *Rostrum* reaching to the end of the metasternum; 1st joint short, stout, a little more than twice as long as broad; 2nd about one-third longer than the 1st; 3rd longest; 4th about equal to the 1st.

Thorax—*pronotum* very much deflected towards the head, with a narrow collar in front; anterior margin about three times narrower than the posterior measured across the posterior angles; disc convex; posterior margin concave across the scutellum. *Scutellum* triangular, longer than the width across the base; apex acute. *Elytra* very much constricted from before to beyond the middle; *membrane* rounded at the apex, with about seven straight nerves, the fourth from the exterior margin furcate from the middle. *Legs*—*thighs*: 2nd pair incrassated with two rows of short teeth on the under-side, 3rd with a long stout tooth on the lower side of the base of the fulcrum: *tibiae*: 2nd pair curved, stouter at the base than at the apex: *tarsi*: 1st joint shortest, 2nd about one-half longer than the 3rd.

Abdomen narrowed at the base.

This genus is very nearly allied to *Allæorhynchus*, Fieber, Eur. Hem., p. 159, but may be readily separated from it by the differences in the pronotum, legs, and elytra, the former, in the present genus, not being constricted beyond the middle, the next having the 2nd pair of thighs incrassated, and the last being constricted before the middle.

ARACHNOCORIS ALBOMACULATUS.

Elongate. *Head* and *antennæ* brown, base of the 2nd and 3rd joints of the latter narrowly pale, apical half of the 4th slightly paler than the basal half. *Pronotum* pitchy-black, very much deflected towards the head, finely punctured, except two callosities behind the collar; posterior angles slightly elevated; posterior margin deeply concave across the scutellum; extremities rounded. *Scutellum* pitchy-black, with a semicircular depression at the base; apex white, slightly elevated. *Clavus* and *corium* pitchy-black, shining, having a steel-blue appearance in certain lights, the latter constricted from before to beyond the middle, and with a white triangular patch; apex white: *membrane* brown. *Legs* pitchy-brown: *thighs*: 2nd pair incrassated with two rows of short teeth on the apical half of the lower margin. *Abdomen* pitchy-brown.

Head—crown brown, convex, with a faint transverse channel in front of the ocelli.

Antennæ brown, sparingly clothed with short hairs; 1st joint projecting its entire length before the head, base of the 2nd and 3rd narrowly white, apical half of the 4th paler than the basal half. *Ocelli* brown, placed about in a line with the posterior margin of the eyes. *Rostrum* brown, reaching to the 3rd pair of coxæ; 1st joint stout, a little more than twice as long as broad, clothed with fine short hairs, 2nd about one-third longer than the 1st, 3rd longest, thinner than the 2nd, 4th about equal to the 1st.

Thorax—*pronotum* pitchy-black, very much deflected towards the head, finely punctured, with a narrow brown collar in front, behind which are two unpunctured shining callosities, separated by a slender faint channel; posterior angles slightly elevated; posterior margin deeply concave across the scutellum; extremities rounded. *Scutellum* pitchy-black, with a semicircular depression in front; apex white, slightly elevated. *Elytra* pitchy-black, shining, with a steel-blue appearance in certain lights, sparingly clothed with short fine hairs: *clavus* pitchy-black, shining, with a steel-blue appearance in certain lights: *corium* considerably constricted from before to beyond the middle, its length being occupied by a triangular white patch, its base about in a line with the apex of the clavus; apex white: *membrane* brown. *Legs* pitchy-brown; *thighs* pitchy-brown; 1st pair sparingly clothed with short semi-erect hairs, lower margin with stouter erect ones; 2nd pair incrassated, with two rows of short teeth on the apical half of the lower margin, base narrower than the apex; 3rd thinner and longer than the first: *fulcrum*: at the base with a long, stout, curved tooth: *tibiæ* pitchy-brown, sparingly clothed with short hairs; 1st pair dark brown, darkest at the apex; 2nd pitchy-brown, curved, thicker at the base than the apex; 3rd brown, base narrowly whitish-yellow: *tarsi*

brownish-yellow, sparingly clothed with short hairs; 1st joint shortest; 2nd longest, about one-half longer than the 3rd; 3rd brown.

Abdomen: underneath pitchy-brown, clothed with very short appressed hairs.
Length, $2\frac{1}{2}$ lines.

Taken at Rio Janeiro.

ARACHNOCORIS DISPAR.

Head yellowish or pale brownish-yellow. *Antennæ* yellowish or pale brownish-yellow; 1st joint projecting its entire length before the head, apex narrowly fuscous; 4th white, base narrowly and apex broadly fuscous. *Pronotum* considerably deflected towards the head, thickly and somewhat deeply punctured, anteriorly yellowish or pale brownish-yellow, posteriorly dark brown. *Scutellum* and *corium* dark purplish-brown: *membrane* brown, with a triangular white patch on the exterior margin adjoining the apex of the *corium*, and a whitish patch immediately opposite on the interior margin. *Legs* dark brown: *tibiæ*: 3rd pair yellowish, base and apex narrowly brown.

Head—*crown* yellowish or pale brownish-yellow, flattish convex. *Antennæ* yellowish or pale brownish-yellow; 1st joint slightly clavate, projecting its entire length before the head, narrowly fuscous at the apex; 4th white, fusiform, base narrowly and apex broadly fuscous. *Eyes* purplish-brown. *Ocelli* purplish-brown. *Rostrum* brown; 1st joint pale brownish-yellow, sparingly clothed with short pale hairs.

Thorax—*pronotum* considerably deflected towards the head; anterior two-thirds and lateral margins narrowly yellowish or pale brownish-yellow; posterior portion brown, the colour fading into the anterior portion; posterior angles slightly elevated; behind the collar a callosity extending almost from side to side, bounded posteriorly by a deep curved channel, in which are three or four deeper punctures; posterior margin concave across the *scutellum*; extremities rounded. *Scutellum* dark purplish-brown, depressed at the base. *Elytra* dark purplish-brown, sparingly clothed with hairs: *membrane* brown, with a triangular white patch on the exterior margin adjoining the apex of the *corium*, and a whitish patch immediately opposite on the interior margin. *Sternum* yellowish or pale brownish-yellow. *Legs* dark brown: *thighs*: all the pairs thinnest at the base; 1st and 2nd armed underneath with two rows of stout bristles: *tibiæ*: 3rd pair yellowish, base and apex narrowly brown.

Abdomen underneath dark brown. Length, $2\frac{3}{4}$ lines.

Taken at Para.

The pale head and pronotum, difference of colouring in the antennæ, absence of the triangular white spots on the *corium*, and pale hinder *tibiæ*, will readily lead to the separation of the species.

The wonderful resemblance these species have to those of *Pilophorus*, Hahn., and *Mimocoris*, Scott, will strike any observer at first sight as remarkable, but the ocelli settle the question at once.

Lee, S.E.: 11th April, 1881.

NEW SPECIES OF LONGICORN COLEOPTERA ALLIED TO
COLOBOTHEA.

BY H. W. BATES, F.L.S.

The following descriptions refer to an interesting group of *Lamiidæ*, peculiar to Tropical America, which are closely allied to *Astynomus*, but differ in their narrow, laterally-compressed form of body, and the presence of a carina on each elytron, separating the vertical sides (epipleuræ) from the dorsal surface.

SYNCHYZOPUS CANCELLATUS.

S. geometrico affinis et similis, sed differt elytrorum signaturis. Purpureo-fuscus, sericeo-nitens, capite thoraceque flavis, illo vittis duabus frontalibus, hoc fascia lata dorsali fuscis; elytris marginibus (basi exceptis) fasciisque duabus, angustis, flavis, apice sinuato-truncatis angulo exteriori spinoso; antennis piceo-fuscis, articulis 4^{to} et 6^{to} basi albis.

Long. 4½ lin., ♀.

Differs from *S. geometricus*, of Nicaragua, chiefly in the fewer yellow lines of the elytra, which are so placed that each elytron may be said to have four large, square, silky-brown spots, separated from each other and the margins (except at the base) by narrow pale yellow lines. The thorax is much shorter than broad, with the sides moderately and regularly rounded in the middle. The lateral carina of the elytra is well marked near the base, but becomes obliterated before the middle. The ovipositor of the ♀ projects to the length of about one-twelfth of an inch beyond the elytra, and its dorsal plate is very acute at the tip, sharply grooved down the middle, and margined on the sides.

Yungas of La Paz, Bolivia (Buckley).

SYNCHYZOPUS LÆTUS.

Purpureo-fuscus, sericeo-nitens, capite antice lineis tribus (quarum mediana usque ad verticem continuata) thorace fascia angusta prope marginem anteriorem, alteraque latiori (medio interrupta) juxta marginem posteriorem, elytrisque utrinque maculis quatuor, pallide flavis; antennis nigris, articulis 3^{to}, 4^{to}, et 6^{to} basi albis; corpore subtilius medio griseo, pectore utrinque macula alba.

Long. 4½ lin., ♀.

Very similar in form to *S. geometricus* and *cancellatus*, but differing widely in the markings of the elytra. These consist, on each, of four pale yellow spots or short fasciæ, viz.: one rounded on the disc towards the base, a fascia near the middle, and a second fascia considerably beyond the middle (neither reaching the suture nor the margin), and a triangular spot at the apex (broadest on the suture). The ovipositor differs from that of *S. cancellatus* by wanting the central groove of the upper segment. In the specimen described it is red and shining.

R. Moronas, Equador (Buckley).

SYNCHYZOPUS POLYSTIGMA.

Niger, capite antice genis et lineis tribus frontalibus (quarum mediana usque ad thoracis basin extensa) elytrisque utrinque maculis novem, flavis: antennis articulis 4to et 6to basi albis: corpore subtus griseo, lateribus cinereo-albo maculatis.

Long. 5 lin., ♀ (excl. ovipos.).

Distinct from all other described species by the central yellow vitta of the thorax, and the numerous pale markings of the elytra; the latter consisting, on each, of nine spots. These spots are:—one, the largest, central on the suture and common to both elytra; two, small, on the epipleuræ; four, also small, scattered over the basal half of the disc; one, rather larger and more transverse, towards the apex; and one on the apical margin. The whitish spots on the sides of the body beneath begin with two narrow belts on the flanks of the prothorax, and are continued, one on each sternal plate and ventral segment, to the apex. The thorax is rather more elongate than in the preceding species, its broadest part being much nearer the base, whence it tapers towards the apex. The elytra are considerably narrowed from base to apex. The ovipositor projects one-eighth of an inch beyond the elytra, and its dorsal segment is convex and ungrooved.

New Granada.

SYNCHYZOPUS DUPLEX.

Facies Colobothearum: elongato-angustus, nigro- vel purpureo-fuscus, sericeus, fronte lineis tribus, vertice vitta latiori usque ad thoracis marginem posteriorem extensa, elytrisque plaga macularia basali fasciisque flexuosis duabus versus apicem, carneo-ochraceis: thorace sub-cylindrico medio paullulum dilatato; elytris apice truncatis extus spinosis; antennis nigris vel piceis, articulis 4to et 6to basi cinereo-albis: subtus medio griseo lateribus dense cinereo-vittatim tomentosus.

Long. 4—5½ lin., ♂ ♀.

In colour and markings much resembling the species of *Colobothrea*, but distinguished from that genus by the narrower thorax (slightly rounded in the middle), and by the ovipositor of the female being slender and projecting considerably beyond the tips of the elytra; both which characters are those of *Synchyzopus*. The upper segment of the ovipositor ends in a sharp point, and is plane above. The spotty, ochreous or pinky-ochreous patches of the elytra are spread very irregularly over the base, but in the middle and towards the apex they are condensed into transverse flexuous belts, and the apex has a large transverse spot of the same colour.

South Brazil, Bahia, Rio Grande.

SPARNA PLATYPTERA.

Facies generis Lyci, elytris paullo convexis, postice gradatim modice dilatatis, apice latissime obtusissime rotundatis, angulo exteriori breviter spinoso; nigra, vertice vitta mediana, thorace vitta laterali, elytrisque humeris fasciæque lata mediana

fulvis: thorace utrinque prope basin dilatato et subspinoso, deinde antice valde angustato; elytris sutura, costis duabus dorsalis, alteraque laterali, elevatis: antennis nigris scapo longissimo. Long. $6\frac{1}{2}$ lin.

Differs from *Sparna lycoides* (Thoms.) chiefly in colour. The tawny spot on the shoulders is connected on each side, by means of a broadish vitta, with the median fascia of the same colour; but the epipleura, up to the base, and a large basal patch common to both elytra, as well as the apical third, remain black. The under-side and legs are black; the bases of only fore and middle femora being reddish.

Province of Paraná, Brazil.

CARNEADES PERSONATA.

Nigra, subtilissime purpureo-fusco sericata, thorace vitta dorsali latissima, elytris plaga communi basali oblonga (medio constricta) maculaque magna rotundata (gutta nigra includenti) versus apicem, et macula triangulari apicali, ochraceis, cinereo-marginatis: antennis nigris, articulis 4^{to}, 6^{to}, et 8^{to} basi albis, scapo ciliato; corpore subtus nigro, sternis utrinque ochraceo-plagiatis, ventre apice ochraceo: thorace subconico a basi usque ad apicem recte angustato: elytris apice truncatis, angulo exteriori longe spinoso, humeris acutis, carinis duabus lateralibus postice evanescentibus, dorso versus basin aspere et parce punctato. Long. 8 lin.

New Granada.

CARNEADES NODICORNIS.

Convexa, tuberculo centro-basali valde elevato, antennarum scapo apice subito fortissime clavato; supra, guttis nigris et rufis late variegata, fasciisque duabus purpureo-fuscis ochraceo-albo marginatis, interstitiis viridi-aneis sericeis: subtus ochraceo-cinereo, pedibus nigris cinereo-annulatis: antennis piceo-rufis, articulis apice nigris, 3^{to}, 4^{to}, et 6^{to} basi cinereis. Long. 6 lin.

A prettily-variegated species, differing from *C. superba*, the type of the genus, in the elytra having strongly-elevated centro-basal tubercles, and the antennal scape being more abruptly clavate. The shoulders of the elytra are prominent, and the lateral carinæ faint, as in that species; the apex is truncated and spined in a similar way. The thorax differs in its sides being prominent and slightly tuberculated in the middle; in colour it is black with reddish marks, and a broad ashy-white vitta on each side.

Equador (Buckley); Frontino, New Granada (Wallis).

CARNEADES RETICULATA.

Oblongo-elongata, albo-cinerea, elytris passim lineis et maculis nigris reticulatim variegatis; thorace supra inæquali, tuberculoque laterali prope basin, dorso litura nigra M-formi: elytris magis parallelis, medio dorso et lateribus fortiter carinatis, apice late truncatis, angulo exteriori valde producto et acuto. Long. 7—8 lin.

Frontino, New Granada (Wallis).

Bartholomew Road, Kentish Town, N.W.:
April, 1881.

Prionocyphon serricornis in Kent.—Last year (in August or September) I took, in Kent, a small orange beetle, which I in vain tried to set properly, and, after breaking several of its legs, I was about to throw it away, but, on second thoughts, I carded it as it was.

A short time ago I took it to the British Museum, where Mr. C. O. Waterhouse recognised it as *Prionocyphon serricornis*, one of our rarest *Coleoptera*.

As I did not know of the insect's rarity when I captured it, I cannot tell what tree it was found on, but it was probably knocked off oak, nut, blackberry, or birch, as those four trees (especially the two former) are the most numerous in the locality. I have never seen it recorded from the south-east of England before, in fact, I believe only a very few specimens have been captured in this country.—E. A. BRUNETTI, 15, Lower Grosvenor Place: April 18th, 1881.

Stigmonota scopariana bred.—I have to-day bred three specimens from the larvæ mentioned at p. 70 of this volume. What a lovely species this is! but why on earth should it come out so early, when not a vestige of its food-plant will be seen for some weeks, in the bleak, cold region where it occurs?

That it appears to be known, however, as an April species is shown by the remarks of my friend Mr. C. G. Barrett at p. 36 of this volume.—J. B. HODGKINSON, 15, Spring Bank, Preston: April 10th, 1881.

Note on Trioza urtica.—The time is fast approaching for the capture of this species of *Psyllidæ* in all its stages, and I herewith give a short description of the nymph form of the creature, for the benefit of those who care to collect and breed it. In June and July these nymphs may be had in great numbers by beating the common nettle (*Urtica dioica*) into a net or, what I consider to be much preferable, an inverted umbrella. When taken home they should at once be placed upon a small plant of nettle set in a flower pot and covered with a glass shade, where they will thrive perfectly. The colour is pale green, shining, the entire margin has a fringe of white hairs, some of which, round the apex of the abdomen, are much longer than others. Head rounded in front. Antennæ pale, apex dusky. Eyes purplish-brown. Elytra-lobes almost white. Abdomen: upper-side sparingly clothed with long, fine, white hairs, and having a roundish pale yellow spot on each side near the base. Length about 1 line.—JOHN SCOTT, Lee, S.E.: April 15th, 1881.

Rare Hemiptera near Hastings.—On April 9th I was fortunate enough to take two specimens of *Gerris rufo-scutellata* at Guestling, one of our rarest British *Hemiptera*. Mr. E. Saunders has kindly verified them: on looking over my collection he also picked out four specimens of *Nabis lineatus*, = *Poweri*, Saund., which I had taken last September at Camber, and a developed specimen of *Stygnoecoris rusticus* from the Hastings district, a species which is very rarely met with in this state.—E. P. COLLETT, 12, Springfield Road, St. Leonards-on-Sea: 18th April, 1881.

Review.

MONOGRAPH OF THE BRITISH APHIDES, Vol. iii; by GEORGE BOWDLER BUCKTON, F.R.S., F.L.S., F.C.S., &c. : pp. 1—142, 28 plates, Svo. London: Ray Society, 1881.

The issue by the Ray Society to its subscribers of this concluding volume of Mr. Buckton's work gives an occasion, which we gladly take, to confirm the generally favourable opinion of the result of the author's labours in a difficult field, which we gave on the appearance of the first volume (vol. xiii, p. 238); and the merits of the work are enhanced by the references made to the recent researches in the biology of *Aphides* by Lichtenstein, Riley, Courchet, Kessler, and others. In an introductory chapter, the author briefly discusses recent views of variation, development and evolution, coming to the conclusion that "Some inscrutable force is connected with the secret of life, with its metamorphic powers, and its attributes of irritability, assimilation, reproduction, and final death," which—a verbal amplification of Cuvier's dictum that "Life is a state of force"—contains the gist of the whole matter.

While we acknowledge the merits of the work and anticipate that great advantage will result to British Entomologists from the knowledge thus brought within their reach, we cannot but regret that so little heed has been given to the defects noted by several reviewers on the first occasion. It is true that the author has so far attended to his critics as to give "A List of Authors, with the approximate date of their Memoirs on Aphides," but this is a poor substitute for the usual indication in its place, of the work, volume, page and plate where the description or figure of a species is to be found; and endless labour is still entailed on those who would follow in the track of research. Another of the more important omissions is indication of the species, or reputed species, of Britain not accounted for in the work. We miss also a combined index to the contents of the three volumes.

At page 61 is characterized a new genus termed "*Stomaphis*, Walker," although it is acknowledged that Walker did not publish any of the generic characters, and only suggested the name. The genus will, of necessity, be always cited as *Stomaphis*, Buckton. Other similar instances might be referred to. In connection with the species on which the genus *Stomaphis* is founded (*Lachnus quercus*) is the following note, derived from Mr. Walker, containing errors which deserve to be corrected. "I think Tugall was the first person to discover *Aphis quercus* in England, and he mentioned it to Stephens, who published a notice thereon about 1847, but I do not find it mentioned in the list of writings of the latter author. About that time Tugall directed me to an oak near Dulwich where I found it; and some years after, the late Mr. Alfred Smee told me of an oak near Weybridge, where I found it again; and subsequently I met with it at Finchley. The male is mouthless, or rather, it has no rostrum." The true story is to be found in the "Transactions of the Entomological Society of London," vol. v, Proceedings, where, at page xx, it is recorded, that at the Meeting on the 2nd August, 1847, "Messrs. J. F. Stephens and Ingall exhibited specimens of *Lachnus quercus*, an Aphideous insect new to this country, found in crevices of bark of oak trees near Dulwich, thrusting its long proboscis nearly up to the base in the wood of the tree, so that it cannot be withdrawn without great difficulty and fear of injuring the insect, in which case the ants immediately

rush to suck up the fluids discharged by the *Lachnus*." At page xxvii it is stated that, at the Meeting on the 1st November, 1847, "Mr. Ingall exhibited specimens of the male of *Lachnus quercus*, remarkable for being destitute of the long rostrum of the female, and also eggs of the same species."

ENTOMOLOGICAL SOCIETY OF LONDON: 6th April, 1881.—W. L. DISTANT, Esq., Vice-President, in the Chair.

G. W. Royston Pigott, Esq., of Eastbourne, was elected an Ordinary Member and Dr. Signoret, of Paris, a Honorary Member.

Mr. Jenner Weir exhibited a beautiful *Noctua* bred in a nursery-garden at Blackheath, which he had not at present been able to identify. Although much resembling a *Gortyna* in colour, its general form rather indicated something allied to *Dicycla*.

Mr. McLachlan exhibited three species of the rare and curious Neuropterous genus *Dilar*, Rbr., viz.:—*D. nevadensis*, Rbr., from Andalusia (recently received from Dr. Staudinger), *D. Hornei*, McLach. (Ent. Mo. Mag., v, p. 239), from N.W. India, and *D. Prestoni*, McLach. (ante, p. 39), from Rio Janeiro. He called attention to the singular unilaterally-pectinate antennæ of the ♂ and the long slender ovipositor of the ♀, the latter indicating some undiscovered habit.

The Rev. A. E. Eaton exhibited (under the microscope) a wood-louse new to Britain, viz.: *Haplophthalmus elegans*, Schöbl, found by him in a garden at Croydon: it had been noticed from Germany and Denmark.

Miss Ormerod exhibited a black nest of a *Termes* from Guyana, attached to the branch of a tree; it bore some resemblance to a negro's head; only apterous forms of the insects had been found in it.

Mr. Pascoe exhibited the insects from a somewhat similar nest found by him at Pará.

Mr. McLachlan said he could not determine, with certainty, the species forming these nests without seeing winged-forms. The insects in Miss Ormerod's nest represented two forms of workers, those of the ordinary form, and others that have been termed "Abeiter Nasuti." In Mr. Pascoe's nest only the latter were apparently present; he thought they were probably *Termes opacus*, Hagen. He alluded to the works of Hagen, Fritz Müller, and Hubbard, on the subject.

Mr. Billups exhibited *Lasiosomus enervis*, H.-S., a very rare species of *Hemiptera*, found by him recently in moss, and of which only few other British specimens existed, taken by Mr. Champion at Chatham: also *Ichneumon erythraeus*, Gravenhorst, a very rare British species of *Ichneumonidæ*.

Mr. McLachlan read a description of a new species of *Corduliina* (*Gomphocromia fallax*) from Ecuador.

Mr. Bridgman communicated additions to Mr. Marshall's Catalogue of British *Ichneumonidæ*, in which he enumerated 60 species new to this country, 13 of which were apparently undescribed. In connection with this paper Mr. Fitch especially alluded to the genus *Pezomachus*, which would be found to be made up, to a large extent, of apterous females of several distinct genera.

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ERRATA.

Page 137, line 15 from bottom, for "this month," read "September," to which the other dates in the same paragraph refer.

219, line 2 from top, for "*subjectus*," read "*despectus*."

" 235 " 18 " bottom, for "House," read "Home."

" 238 " 14 " " for "brevicornis," read "lunicornis."

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ERRATA.

Page 315, line 2 from top, for "*subindus*," read "*dispergus*."

— 325 — 24 — bottom, for "*Hamæ*," read "*Hama*."

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